



BBA Conference 2023

“RECONSTRUCTION, REGENERATION & REINTEGRATION”

20th – 23rd June 2023

Royal College of Surgeons Ireland

The following CME points have been awarded:

Tuesday 20th June 2023 (consensus day) – 5 points

Wednesday 21st June 2023 – 8 points

Thursday 22nd June 2023 – 6 points

Friday 23rd June 2023 – 7.5 points



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Ascanio Tridente

Major Events

Consensus Day

Tuesday 20th June at 11:00 – 16:00

AGM

Wednesday 21st June at 12:45

Wallace Lecture

Thursday 22nd June at 11:20

Special Interest Groups (SIGs)

Wednesday 21st June – 10:30

- Prevention SIG – TR3

Friday 23rd June – 09:45 & 12:50 (x2)

- Burns therapists interest group (BTIG) – TR3
- Nurse SIG meeting – O’Flanagan Theatre
- Psychological SIG meeting – TR3

Social Functions

BBQ: Tuesday 20th June – The Pavilion, Trinity College, 18:30.

Drinks Reception: Wednesday 21st June – The Boardroom, RCSI, 18:30-19:30.

Conference Dinner: Thursday 22nd June – Trinity College Dublin.

Drink reception & tour of the Grand Library Long Room from 18:15-19:30.

Dinner in the 1592 dining hall at 19:30. **Ticket holders only.**

Whiskey tasting: Thursday 22nd June – The Whiskey Museum.

2x servings per attendee at 23:00. **Ticket holders only.**

Invited Speakers

Wednesday 21st June

Professor Cathal Kelly – Welcome to the College of Surgeons

Professor Cathal Kelly took up the position of Registrar in December 2009. A Graduate and Fellow of RCSI, Prof. Kelly was previously Dean of the Faculty of Medicine & Health Sciences from 2006-2009.

Prior to his appointment, he was a consultant general and vascular surgeon with a special interest in endovascular surgery in Beaumont Hospital. He combined this role with chairmanship of the surgical division and an academic position in RCSI as Vice-Dean for curriculum change. In addition to completing his basic and higher surgical training in Dublin, Prof. Kelly pursued a research fellowship at the University of Pennsylvania in Philadelphia, USA.

Prof. Kelly has won the prestigious Patey Prize of the Association of Surgeons of Great Britain & Ireland for research he conducted at Beaumont Hospital and he has also obtained first place in the intercollegiate Specialty Board Exams

Professor Folke Sjöberg – Strategy to optimise - Survival of the Burn injured patient

Professor and Consultant Folke Sjöberg, the president for the International Society for Burn Injuries (ISBI)

Director, the Burn Center at Linköping University Hospital

Folke has been a Visiting professor at the Institute de Recherches Servier, Centre de Recherches de Suresnes, Paris, France (1995) and at Dept. of Clinical Physiology (CNR), University of Pisa, Italy (1997). Further, he has been Medical Director, Berzelius Clinical Research Center, Linköping, Sweden (2002 – 2009) and the President European Burns Association (EBA) between 2007 and 2009. During 2009 – 2013 he was the Director Research and Development; the Swedish Intensive Care registry. He has been a member of the "Verification Committee" American Burns Association during 2014 to 2017. He was the Deputy Vice-Chancellor, Linköping University and since 2013 guest Professor of the Suez Canal University, Ismailia, Egypt. Folke regularly engages in lectures for Medical Students, and doctors in specialty training as well as being supervisor for Students in the Masters program. He has supervised > 40 undergraduate medical students and more than 40 PhD students. Folke has also been the primary investigator > 300 clinical trials, ranging from phase I-IV.

He has co-authored more than 400 original peer reviewed scientific papers, including book chapters and books. Most of them in the field of Burns, Critical Care and Microcirculation.

Professor Jyrki Vuola – Do we need a European Burn Association?

Prof. Jyrki Vuola, general and plastic surgeon, trained at the University of Helsinki and Helsinki University Hospital. He is the present president of the European Burn Association and former director of the Helsinki Burn Centre in 1993-2021. His research activities concern mainly burns and wound healing. Another focus is reconstructive head and neck microsurgery. He is a member of the Editorial Board of Burns and the new series, European Burn Journal.

Thursday 22nd June

Ken Dunn – Wallace Lecture – Past, present and future of burn care in the digital age

Ken Dunn is a recently retired Consultant from Manchester, England and until 2018 the Director of the Manchester Burns and Plastic Surgery Service. He is a past Chairman of the British Burn Association and the National Burn Care Review Committee. He is the Medical Director of the International Burn Injury Database (iBID: www.ibidb.org) and currently the GIRFT and NCIP clinical lead for Burns and Plastic Surgery and has several roles within the National Wound Care Strategy Programme.

Stuart Watson - Surgical strategy in burn reconstruction

Stuart was Consultant Burns and Plastic Surgeon in Glasgow for 26 years before retiring in 2022. Prior to that, he enjoyed training in Manchester, Leeds and Liverpool.

He continues to work with colleagues overseas in training and development, especially in Ghana and Malawi. He also has a more limited teaching commitment in Glasgow, and does advisory work with WHO.

Dr Raja Shanmuga Krishnan – Burn Care Internationally: Building Burn Services in India: Moving From complex reconstruction to Early intervention

Dr Raja Shanmuga Krishnan is a Consultant Oncoplastic Breast Surgeon and Plastic Surgeon at Ganga Hospital, Coimbatore, India since July 2018. He did his undergraduation from Madurai Medical College and won the Gold medal for Plastic Surgery and a Certification of merit for medicine. He did his post-graduation in General Surgery at Madras Medical College and won the Edmund Lerede Chalkie Prize for the best postgraduate in general surgery. In the DNB Entrance Examination, he was the first person to chose Plastic Surgery in India and opted to do DNB Plastic surgery at Ganga Hospital. He won the Gold medal in Plastic Surgery conducted by Madras Medical College for all plastic surgery postgraduates in Tamil Nadu and the Gold Medal for the best presentation conducted by the Tamil Nadu and Pondicherry Plastic Surgery Association. He won the first price in S K Bhatnagar quiz conducted for all Plastic Surgeons in India by the Association of Plastic Surgeons of India for two successive years.

He cleared MRCS and all three steps of USMLE. He trained as a Senior Fellow in Plastic Surgery under the mentorship of Prof. Venkat Ramakrishnan and Dr Naguib El Muttardi at St. Andrew's Centre for Plastic Surgery at Chelmsford, UK which is a world-renowned centre for Breast Reconstruction and Burns for two years. He learnt breast aesthetic surgery from Prof. Venkat Ramakrishnan. He trained under Dr Rod Rohrich, a doyen in rhinoplasty and cosmetic surgery at Dallas, USA for three months. He visited the Shriners' Institute, Galveston for a month to learn more about the management and rehabilitation of burns. He also learnt body contouring from Dr Joseph Capella, New Jersey, USA and visited other centres at Mayo Hospital, Rochester and New Orleans.

Ever since his return to India, he is practising as a Consultant Plastic Surgeon at Ganga Hospital. He is also passionate about skin donation and speaks about it in various camps and forums. Beyond medicine, he loves watching cricket, good food and spending time with family and friends.

Dr Eric Wong - Developing Sierra Leone First Sustainable Burn Services. The Challenges and Opportunities

Dr Eric Wong is one of Sierra Leone's first reconstructive surgeons, supported by Resurge Africa, Freetown Sierra Leone

Friday 23rd June

Professor Naiem Moiem - Tissue Regeneration

Naiem Moiem, MB BS, MSc, FRCS (Plast) is consultant plastic and burns surgeon at University Hospitals Birmingham and Honorary Professor at the University of Birmingham. He is Director of the ScarFree Foundation Centre for Burn Research in Birmingham and the Clinical Lead of the Midland Burns Care Network, serving a population of 13 million in the midland region.

Naiem is Immediate Past President of the International Association of Burn Injury (ISBI), Past President of European Burn Association Executive, and Past Chairman of the British Burn Association (BBA). He is Editor-in-Chief of the European Burn Journal, member of senior editorial board of BURNS and Journal of Burn Care and Research and was past deputy editor of Journal of Burn and Trauma. Naiem is on the Board of Trustees of the International Burn Foundation IBF (2014- current), and The Vocational Training Charitable Trust, VTCT Foundation.

Professor William Norbury - Harnessing Laser in Burn Care

William Norbury FRCS(Plast) is a Consultant Plastic & Reconstructive Surgeon. Having completed training in Chelmsford, Swansea and the USA, he has held Consultant posts at both The University of Texas Medical Branch and Shriners Children's Texas, USA since February 2022.

He has a special interest in the management of burns and scars. He is the Director of the Burn Reconstruction fellowship at Shriners Children's Texas.

Professor Rob Kelly - Self-care for Healthcare Professionals – who is looking after you?

Consultant Cardiology and Lifestyle Medicine. I work in private practice at Beacon Hospital, Dublin. I am an Interventional Cardiologist. I graduated RCSI in 1992. I trained in UK and USA.

I developed an interest in Lifestyle Medicine mid-career, that led me to board certification, and I now integrate that in my Cardiology clinical practice and in teaching.

More recently I coach health habits to healthcare professionals, public and patients to help change their health behaviours.

I teach at UCD Beacon and RCSI Medical Schools.

I run Self- Care Health Coaching programs for hospital staff.

Sponsored Symposia

Thursday 22nd June – 12:00 – 12:30

PolyNovo Sponsored Symposium - BTM: the global evidence base in burn care and our clinical experience at the Mersey Regional Burn Centre

Presented by Professor Kayvan Shokrollahi.

Programme of Events

Tuesday 20th June (Consensus Day)

10:30am	Registration & refreshments Front Hall, York Street
11:00am	Introduction and consensus framing Professor Odhran Shelley – TR1-3
11:15	Fluid resuscitation - Threshold. formula fluids, crystalloid vs colloid. FFP. Adjustments for obese pregnancy etc. - Pete Berry and Andy Williams
Break and Selfie Treasure Hunt around Dublin 12:30 – 13:30 https://earth.google.com/earth/d/1vNSZA8y_jAIFoCkeJAtD1GBCUbNzPDaE?usp=sharing Please Return promptly!	
13:30	TENS - Management strategy, fluids, frailty, wound care - Preetha Muthayya, Jorge Leon Villapolis
14:30	Enzymatic consensus - Results from BBA Delphi - Nicole Lee and Brendan Sloane
Coffee break 15:30 – 15:45	
15:45	Scar Consensus - Results of BBA survey. Prioritisation in scar management, Tools and agreed outcome assessment structure PROMS PREMS - Michelle O'Donnell and Vicky Dudman
Close 17:00	
BBQ at The Pavilion – Trinity College 6:30pm – until late	

Wednesday 21st June

7:30am	Registration opens Front Hall, York Street
8:30am	Welcome to conference Professor Odhran Shelley – O’Flanagan Theatre
Free papers – Session 1 Acute Care Chairs: Odhran Shelley and Jorge Leon Villapolis O’Flanagan Theatre	
08:40	10-year review of major burn patients presenting to a regional Burns Unit ($\geq 25\%$ TBSA for adults), 2013 to 2022. - Jonathan Davies, Nottingham University Hospitals NHS Trust, England
08:50	Does early wound coverage provide an independent survival advantage over and above burn excision itself in major burns? Results from the largest international dataset on major adult burns – Laura Cappuyns, Mersey Burn Centre, Whiston hospital, Merseyside, England
09:00	The Effect of Obesity in Acute Outcomes of Resuscitation Level Burns Injuries – David Cussons, St. Andrew's Centre for Burns And Plastic Surgery, England
09:10	Hypothermia is associated with an increased mortality risk in severely burned patients: a retrospective review – Anam Asad, Royal Bolton Hospital, England
09:20	Burn Injury Assessment Study (BIAS) - Bill Hickerson, University of Tennessee Health Science Centre, USA,
09:30	Safety of Targeted Temperature Management Following Burn Injuries with Concomitant Cardiac Arrest: A Case Report and Review of the Literature -William Hghes, Thomas Jefferson University Hospital, USA
09:40	Rise of the (Learning) Machines: Artificial Intelligence for the Assessment of Adult Thermal Burns –Bill Hickerson, University of Tennessee Health Science Centre, USA,
09:50 – 10:05	Panel discussion
10:05 – 10:25	Consensus of fluid resuscitation – Pete Berry
Coffee/Exhibitors and poster session 1 10:25 – 11:00 Exam Hall & TR1-2	
10:30 – 11:00	Prevention SIG meeting TR3

10:30 – 11:00	Education committee meeting Theatre	O’Flanagan
<div>Free papers – Session 2</div> <div>Patient Assessment</div> <div>Chairs: Mark Abrahams and Pete Berry</div> <div>O’Flanagan Theatre</div>		
11:00	Achieving optimal pre-operative nutrition in adult burns patients, in both an inpatient & outpatient setting, by using a pre-load isotonic carbohydrate drink – Mamie O' Reilly, Chelsea & Westminster Hospital, London, England	
11:10	The role of Echocardiography in assessment of Burn patients to determine perioperative risk in comorbid patients – Margaretellen Clerkin, St James Hospital, Dublin, Ireland	
11:20	Defining the “elderly” population in the treatment of major burn injuries: A dataset of over 1000 patients from 54 burn centres, worldwide - Nina Dempsey, Mersey Burn Centre, Whiston hospital, Merseyside, England	
11:30	Predicting Elderly Burns one-year survival rate in Ireland - the incorporation of the Frailty score – Josh Skeens, St James Hospital, Dublin, Ireland	
11:40 – 11:55	Panel discussion	
11:55 – 12:40	Strategy to optimise - Survival of the Burn injured patient – Prof Folke Sjoberg, Linkoping , Sweden Panel Discussion	
12:45– 13:00	BBA AGM	
<div>Lunch, Exhibitors & Poster session 2</div> <div>12:45 – 13:50</div> <div>Exam Hall & TR1-2</div>		
13:50 – 14:00	Welcome to the College of Surgeons – Prof. Cathal Kelly – Chief Executive Officer RSCI	
14:00 – 14:40	Do we need European Burn Association?- Jyrki Vuola , Helsinki , Finland Panel Discussion	
<div>Free Papers – Session 3</div> <div>Wound Care</div> <div>Chairs: Michelle Hughes and Helen Nolan</div> <div>O’Flanagan Theatre</div>		
14:40	Northeast of Scotland Sealed Silver dressing practice in Paediatric burn injured patients – Kazem Al-masri, Nhs Grampian, Scotland	

14:50	Case Series and Scoping Review Evaluating the Use of Spincare for the Management of Paediatric Burns – Matthew Bellamy, Sheffield childrens Hospital, UK
15:00	Implementation of Negative Pressure for Acute Paediatric Burns (INPREP): Barriers, Enablers and Implementation Strategies for a Stepped Wedge Randomised Trial – Bronwyn Griffin, Griffith University, Queensland, Australia
15:10	Early experience of BTM in acute and reconstructive paediatric burns – William Crohan, Fiona Stanley Hospital, Australia PRE-RECORDED
15:20	The changing face of a paediatric burns unit in times of NHS pressures – adapting to meet new challenges – Brendan Sloan, Pinderfields Hospital, Wakefield, UK
15:30	The feasibility of Negative Pressure Wound Therapy versus Standard Dressings in Paediatric Hand and Foot Burns: A Pilot, Single-Centre, Randomised Control Trial – Emma Lumsden, Queensland Children's Hospital, Australia
15:40	Experience with a Biosynthetic Cellulose Dressing (Epiprotect) at a Regional Paediatric Burns Unit – Omar Abbassi, Pinderfields, UK
15:50 – 16:00	Panel Discussion
Coffee, Exhibition & Poster session 3 (TR1-2) 16:00 – 16:20 Exam Hall & TR1-2	
Free Papers – Session 4 Infections in Burn Care Chairs: Preetha Muthayya and Nicole Lee O’Flanagan Theatre	
16:20	Burning questions answered: A review of blood stream infections in Burns patients - Anne-Marie Dolan, St James Hospital, Dublin, Ireland
16:30	Investigation of an outbreak of Panton–Valentine leucocidin positive methicillin resistant Staphylococcus aureus in the National Burns Unit using whole genome sequencing – Tamara Hoban, St James Hospital , Dublin, Ireland
16:40	The prevalence and outcomes of toxin producing staphylococcus aureus in paediatric burn wounds – Adam Couves, Royal Hospital for Sick Children, Glasgow , Scotland
16:50	MANAGEMENT OF MRSA wounds: Topical bacteriostatic dressing vs triple ointment dressings - Muhammad Hassaan Tariq, BURN CARE CENTRE PIMS, Islamabad, Pakistan
17:00	NEXOBRID APPLICATION AS A DAY CASE PROCEDURE: A SINGLE UNIT EXPERIENCE BEFORE AND DURING COVID-19 PANDEMIC – Shazrinizam Shaharan, UK
17:10	Central venous catheter related bloodstream infections in adult inpatients in a tertiary burns intensive care unit – Teniola Adeboye, St Andrew’s Centre for Plastic Surgery and Burns, Essex, England

17:20 – 17:30	Panel Discussion
17:30 – 18:00	Consensus on Enzymatic debridement, Nicole Lee
18:00 – 18:30	Tours of the conference venue
<p>Drinks overlooking St Stephens Green, Old College Hall, RSCI</p> <p>18:30 – 19:30</p> <p>Boardroom/ Blue Room</p>	

Thursday 5th May

8:00am	Registration opens
<p align="center">Free Papers – Session 5 Surgery and Reconstruction Chairs: Peter Dziewiulski and Claire Black O’Flanagan Theatre</p>	
08:30	Pinch Grafting--A Historical Review and a 21st Century Reprise: Does a Lost Technique Offer Functionally Invisible Donor Sites and Imperceptibly Healed Recipient Sites? – James Jeng, University Of California Irvine, USA
08:40	Reflections on 5 years of experience with BTM reconstruction – Richard Wong, National Burn Centre for New Zealand, Te Whatu Ora Health, New Zealand
08:50	The Role Of structural Fat Grafting in Burn Reconstruction – Odhran Shelley, St James Hospital, Dublin, Ireland
09:00	Intraoperative 3D bioprinting after skin injury to promote regenerative repair – Mark Fear, University of Western Australia, Perth ,Australia
09:10	First, do no harm: a survey of patient’s perceptions of their split-thickness skin graft donor sites – Sarah Bache, State Burns Unit, Perth, Western Australia
09:20	Lyophilized Porcine Bladder followed with Polyurethane Dermal Matrix for Infected Wounds Bearing Exposed Bone or Tendon: A New Lowest Rung on the Reconstructive Ladder? – James Jeng, University Of California Irvine, USA
09:30	A case series using acellular dermal matrix fish skin in reconstruction of full thickness wounds - Sai Ramakrishna, Velamuri University of Tennessee/Medical Director Firefighters Burn Center, USA
09:40	denovoSkin® dermo-epidermal skin substitute for paediatric burn wound reconstruction - Khairun Izlinda Abdul Jalil, Dept Of Plastic Surgery, Children’s Health Ireland
09:50 – 10:05	Panel discussion
<p align="center">Coffee/Exhibitors and poster session 4</p> <p align="center">10:05 – 10:40</p> <p align="center">Exam Hall & TR1-2</p>	
10:05- 10:40	Research SIG meeting TR3
<p align="center">Free Papers – Session 6 Collecting Burn Data Chairs: David Barnes and Azzam Farroha O’Flanagan Theatre</p>	

10:40	Establishing burn registers: the role of digitisation of routinely collected data globally – Emily Bebbington, Bangor University And Ysbyty Gwynedd, Wales
10:50	Exploring the similarities and differences of variables collected by burn registers globally: results from a data dictionary review study – Joanna Miles, Norfolk & Norwich University Hospitals NHS Foundation Trust, England
11:00	Burn injury prevention in low- and middle-income countries: scoping systematic review - Kwang Chear Lee, Queen Elizabeth Hospital, University Hospitals Birmingham NHS Foundation Trust, England
11:10 – 11:20	Panel Discussion
11:20 – 12:00	Wallace Lecture – Chair: Odhran Shelley Past, present and future of burn care in the digital age - Ken W Dunn FRCS(plast), Manchester, England
12:00 – 12:30	PolyNovo Sponsored Symposium BTM: the global evidence base in burn care and our clinical experience at the Mersey Regional Burn Centre Mr Dilnath Gurusinghe and Professor Kayvan Shokrollahi, Whiston Hospital, England
Lunch, Exhibitors & Poster session 5 12:15 – 13:00 Exam Hall & TR1-2	
Free Papers – Session 7 Burn Care lessons Around the World Chairs: Sarah Bache and Mark Fisher O’Flanagan Theatre	
13:00	Burn lessons learned from the Whakaari White Island volcanic eruption – Richard Wong, National Burn Centre for New Zealand, Te Whatu Ora Health, New Zealand
13:10	A comparative study between negative pressure wound therapy and with conventional dressings in burn management with skin graft to assess wound healing and outcomes; A prospective comparative study – Rajpal Singh, Choithram Hospital And Research Centre , Indore, Madhya Pradesh, India
13:20	Extract of Tamarindus indica seeds: towards alternative strategies to combat antimicrobial resistance in infected burn wounds – HY Lam, Hospital Universiti Sains Malaysia/Dept. of Reconstructive Science Unit, Kubang Kerian, Malaysia
13:30	Treatment of exfoliative skin disorder in a burn centre of LMIC - Muhammad Hassaan Tariq, BURN CARE CENTRE PIMS, Islamabad, Pakistan
13:40	Developing Sierra Leone First Sustainable Burn Services. The Challenges and Opportunities - Eric Wongo, Resurge Africa, Freetown, Sierra Leone,

13:50	Educating on burns management in Accra, Ghana –Matthew Baynham, Glasgow Royal Infirmary, Glasgow, Scotland
14:00	Enhancing Global Burn Care by Coeducating Practitioners from low and high-income countries via a synchronous online burns course based in the UK – Nicole Lee, Chelsea And Westminster, London, UK
14:10	Priorities in Global Burns Research: Preliminary results from the first priorities setting survey – Rob Staruch, Oxford University Hospitals NHS Trust, UK
14:20 – 14:35	Panel Discussion
Coffee, Exhibition & Poster session 6 14:35 – 15:10 Exam Hall & TR1-2	
Chairs: Nick Arkoulis and Odhran Shelley	
15:10 – 15:40	Surgical strategy in burn reconstruction - Stuart Watson, Canniesburn Plastic Surgery Unit, Glasgow, Scotland
15:40 – 16:10	Burn care Internationally Building Burn Services in India: Moving From complex reconstruction to Early intervention - Raja Shanmugakrishnan Ganga Hospital, Coimbatore, India
16:10 – 16:20	Case Discussion -Solution for difficult cases from 3 mission hospitals in Zambia. 3 Patients (Angola, Congo and Malawi) Goran Jovic, Zambia
16:20 – 16:40	Burn Network and Shared Learning Internationally Odhran Shelley, Stuart Watson, Mark Fisher, Sian Falder, Folke Sjobery, Ram Velamuri, Jyrki Vuola, Opoku Ampomah, Naiem Moiemen, Raja Shanmugakrishnan
16:40 – 16:50	Consensus Statement – International networking and training, The future of sharing knowledge – Odhran Shelley
Tours of the Grand Library Long Room, Trinity College Dublin Followed by drinks reception and dinner 18:15 – 19:30 Tours and drinks 19:30 - 23:00 Dinner Trinity College Dublin	

Friday 6th May

7:30am	Registration opens – Front Hall, York Street	
	Free Papers – Session 8 Basic Science Chairs Simon Booth and Odhran Shelley O Flanagan Theatre	Free Papers – Session 9 General and Psychology Chairs: Bill Hughes and Kayvan Shokrollahi Cheyne Theatre
08:10	Measurement of Platelet Thrombus formation in Severe Thermal Injury – Paul Harrison, University of Birmingham	Exploring the role of Computer-Assisted Decision-Support Tools in burn management: A rapid review – Aqeel Mohamed, Gkt School Of Medical Education, King's College London, UK
08:20	The effect of burn injuries on brain transcriptomics and metabolomics – Mark Fear, University of Western Australia	Integrating consumer Virtual Reality systems into the burn centre: overcoming obstacles in hospital integration of non-proprietary systems for patient benefit – Laura Cappuyns, Mersey Burn Centre, Whiston hospital, Merseyside, England
08:30	The impact of LOX inhibition on extracellular matrix production and its potential for the treatment of scar – Mark Fear, University of Western Australia	Developing Online Support for People Affected by Burn Injuries – Christia Huntington, The University of the West of England
08:40	Major thermal injury is associated with evidence of long-term epigenetic remodelling and accelerated biological ageing – Jack Sullivan, Institute of Inflammation and Ageing, University of Birmingham	A proposal of updates to the (2010) LSEBN adult psychosocial training – Lisa Williams, Chelsea And Westminster Hospital
08:50	Novel Haematological and Neutrophil Parameters in Severe Thermal Injury - Ali Asiri University of Birmingham	Self-harm Burn Injuries at Stoke Mandeville Hospital Burns Unit - a 10-year review 2012-2022 – Galini Mavromatidou, Buckinghamshire Healthcare NHS Trust
09:00	Foot burns: a problem exclusive to diabetic patients? – Hadyn Kankam - University Hospital Birmingham.	Self-Inflicted Versus Accidental Burn Injuries: A Systematic Review of Characteristics and Outcomes – Ezekwe Amirize, Queen Elizabeth Hospital Birmingham
09:10	Outcomes and complications in the diabetic burns patient – experience from The National Burns Unit in Ireland – Sorcha Leary, St James Hospital, Dublin, Ireland	Lithium polymer battery fire as a new cause of Polymer Fume Fever – Pete Berry, St Andrew's Centre, Broomfield
09:20 – 09:35	Panel discussion	Panel Discussion

Coffee/Exhibitors and poster session 7 09:35 – 10:15 Exam Hall & TR1-2	
09:45 – 10:15	Burns Therapist Interest Group (BTIG) SIG Meeting TR3
10:15 – 10:45	O Flanagan Theatre Tissue Regeneration – Prof. Naiem Moiemmen, Birmingham, UK
10:45 – 10:55	Discussion
Free Papers – Session 10 Scar Assessment and intervention Chairs: Vicky Dudman and David Barnes O’Flanagan Theatre	
10:55	Health Literacy in a scar treatment portal website: Can Personal and Public Involvement help in detecting the benefits and pitfalls? – Peter Moortgat, Oscare Npo
11:05	Randomised controlled trial for treatment of hypertrophic burns scars with the pulsed dye laser: Early Laser for Burn Scars (ELABS) update – Mark Brewin, Salisbury NHS Foundation Trust
11:15	The effect of Endermologie treatment on scar quality from patient and clinician perspectives using the patient observer scar assessment scale (POSAS) – Amy Gillen, St. James's Hospital Dublin
11:25	The use of the LymphaTouch® negative pressure therapy device to improve outcomes in hypertrophic and hypersensitive scarring – Michael James, Mersey Burn Centre, Whiston hospital, Merseyside, England
11:35	Measuring change in burn injury scar tissue following a 10-week course of Lymphatouch (LT). A descriptive study – Michelle O'Donnell, St James's Hospital
11:45	Laser treatment for scar reduction may be more effective when used for scars less than six years old - Yung-Yi Chen, Institute of Inflammation and Ageing, University of Birmingham
11:55	Under the surface: Clinical considerations for scar thickness measurement using ultrasound based on a scoping review – Brandon Meikle, The University Of Queensland, Australia
12:05	Experiences and reflections in establishing a new MDT advanced scar clinic and the initial findings - Louise Rodgers, Queen Victoria Hospital
12:15 – 12:30	Panel Discussion
12:30 – 12:40	Burn Scar Consensus – Michelle O’Donnell
Lunch, Exhibition & Poster session 7	

12:40 – 13:20		
Exam Hall & TR1-2		
12:50 – 13:20	Nurse SIG Meeting – O’Flanagan Theatre	Psychosocial SIG Meeting – TR3
13:20 – 14:00	LASER in Burn Scar – Prof. Will Norbury, University of Texas Medical Centre, Galveston, Texas, USA	
<div>Free Papers – Session 11</div> <div>Recovery Rehabilitation & Reintegration</div> <div>Chairs: RuthAnn Fanstone, Michelle O Donnell</div> <div>O’Flanagan Theatre</div>		
14:00	The rehabilitation continuum: Early vocational burns therapy in both the inpatient and outpatient settings – Hollie Halls, Salisbury NHS Foundation Trust, England	
14:10	A day in the life of a rehabilitation patient – Poppy Cole, Queen Victoria Hospital	
14:20	Recovery of Functional Independence following Major Burn Injury: a Systematic Review – Ali Jawad, Welsh Centre for Burns and Plastic Surgery, Swansea, Wales	
14:30	The roles of psychological flexibility and self-compassion in appearance distress following burn injuries: A multi-centre cohort study – Laura Shepherd, Nottingham University Hospitals NHS Trust, England	
14:40	Understanding the barriers and enablers for seeking psychological support following a burn-injury - Lianne Mcdermott, Stoke Mandeville Hospital/University of Oxford, England	
14:50	Qualitative analysis of the psychological experiences described by burns, plastics, and reconstructive surgery patients from the perspectives of the cognitive and metacognitive models – Imelda Arthern, Wythenshawe Hospital	
15:00 – 15:15	Panel Discussion	
<div>Coffee, Exhibition & Poster session 8</div> <div>15:15 – 15:40</div> <div>Exam Hall & TR1-2</div>		
15:40 – 16:10	Self-care for Healthcare Professionals – who is looking after you? – Prof. Rob Kelly	
<div>Free Papers – Session 12</div> <div>Future directions</div> <div>Chair: Nick Arkoulis and Laura Shephard</div> <div>O’Flanagan Theatre</div>		

16:10	Aftercare of burn survivors beyond leaving hospital. The new research, development and technology and the survivors being left behind – Erin McNeill Proudfoot, Burn Survivor / Canniesburn Unit Glasgow, Scotland
16:20	Dan's Fund For Burns Befriender Peer Support Service: A befriender / befriendee experience – Polly Brooks, MBE Dan's Fund For Burns
16:30	Bearing witness: Celebrating the journeys of burns survivors and their families – Katherine Nutt, St Andrews Centre, Broomfield Hospital, Chelmsford, Essex, England
16:40 – 16:50	Panel Discussion
Presentation of awards and close of conference	

Poster List

P1	Tim	Burge	First web space contractures: a simple and patient-friendly classification system
P2	Tooba	Arif	A review of minor burn injury management by community pharmacies in South East England
P3	Nicola	Beavan	Development of a burns dressing pathway to improve healing time for paediatric patients
P4	Sue	Boasman	The challenge of burn itch - a non-pharmacological approach
P5	Sue	Boasman	Retained staples in healed burn wounds - an accepted risk or poor practice?
P7	Laura	Cappuyns	Audit of the referral system for acute burns at a regional burn centre
P8	Lihan	Zhang	A Very Unusual Burns Complication: Bilateral Endogenous Bacterial Endophthalmitis
P9	Lisa	Slack	Management of delirium and cognitive impairment through use of sensory normalisation as an intervention
P10	Maria	Chicco	Enzymatic debridement of deep facial burns with Nexobrid™: the Queen Victoria Hospital experience
P11	Rajan	Choudhary	Weighing In on Burns Recovery: The Value of Accurate Patient Weight Measurements
P12	Jasmine	Crane	Cum grano salis - how useful are skin pH measurements in chemical burns?
P13	David	Cussons	8-year follow-up of an original case of enzymatic debridement in the UK
P14	David	Cussons	Absent consensus on skin preparation and antibiotic prophylaxis in burn surgery
P15	Lee	Nathaniel-wurie	A quantitative analysis of surgical fluid infiltration in the non-resuscitation Paediatric burn harvest and grafting
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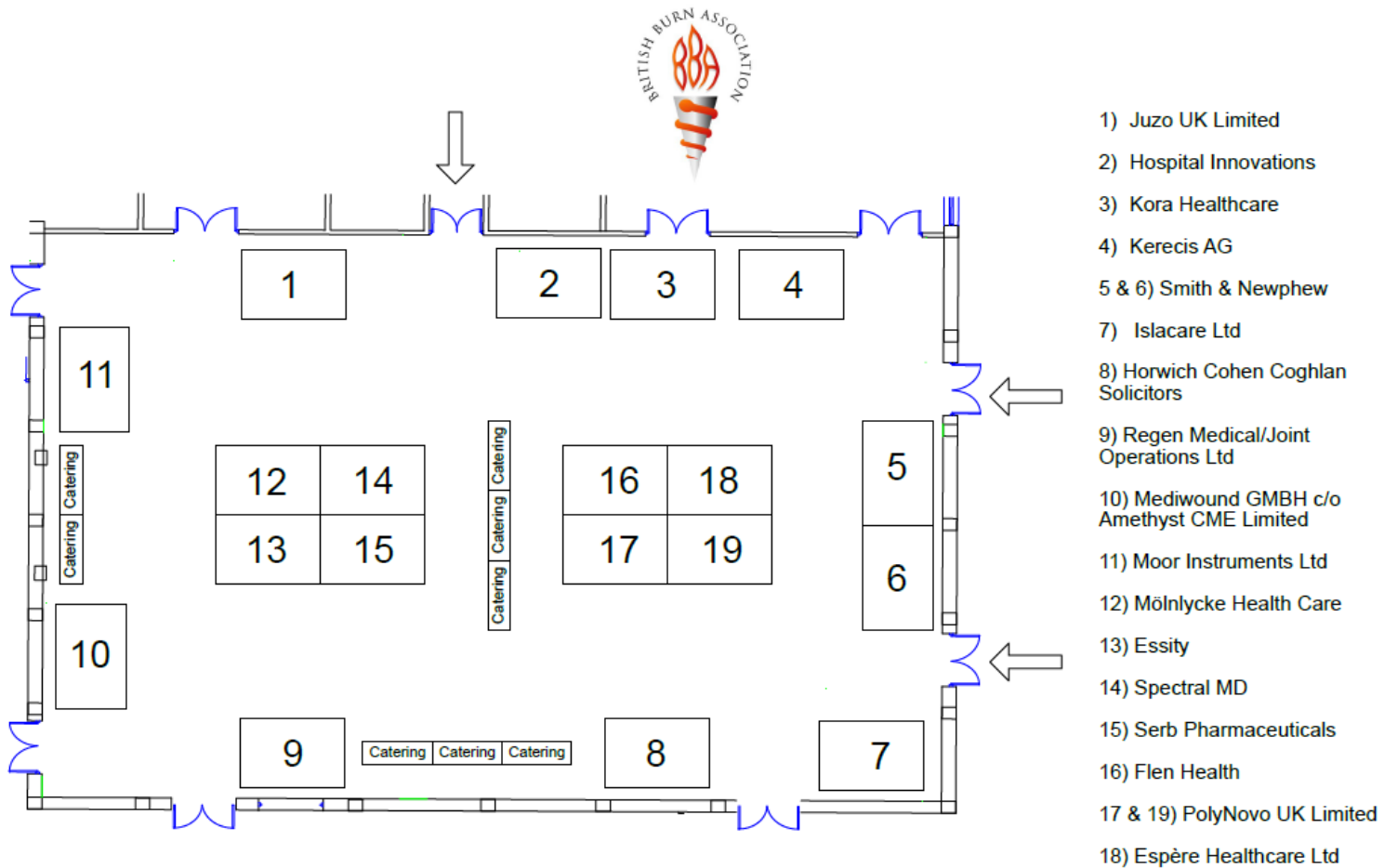
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Exhibition Floor plans – Exam Hall



Exhibitor Profiles



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Oral Presentation Abstracts

Aftercare of burn survivors beyond leaving hospital. The new research, development and technology and the survivors being left behind.

Mcneill Proudfoot E¹

¹*Burn Survivor / Canniesburn Unit Glasgow*

Burn survivors once discharged from hospital care, years down the line, out with further hospital care not being kept up to date about opportunities available for further research, new treatments and developments taking place.

From personal experience I write this, the world of burn treatments, reconstructive surgeries and technology is fast developing. I myself sustained 45% burns in a house fire, spent 12 weeks in intensive care and a further 4 months in Canniesburn Burn Unit at Glasgow Royal Infirmary in Scotland. In every way I received the best and new pioneering treatment at the time of my accident. The care was in no doubt of being revolutionary and outstanding by all involved.

In 2009 the aftercare was available to an extent, physiotherapy, pressure garments, lotions and camouflage make up was there. It was explained to myself that yes, in time my extensive scarring would change, as would my body but I don't entirely think I fully understood how this would affect myself 10-12 years down the line.

I have experienced reconstructive surgery myself. But it has become very apparent at this stage in my journey as a burn survivor, now issues really are arising with my scarring and developing, that there is so many new treatments and procedures now available that without looking for resolutions on search engines, I truly never would have realised existed.

At this point it became a great realisation that myself and so many other Burn survivors have gotten somewhat lost, at the point of returning home we have aftercare, but what about years down the line, what about the aftercare after the initial aftercare as such.

Having never truly written a paper nor read one in relevance to this matter, I feel this is something we may have not even realised is actually happening. So many medical advancements are taking place in reconstructive surgery and care, but are those in need of it, truly being kept fully informed so they are aware of the progress and can gain access to it. We can all ask for a referral from our local GP to a Plastic Surgery Unit, but are we as burn survivors being kept up to date with new procedures and treatments that could really benefit us having not been available at the time of our injuries.

In the past few weeks, I have spent hours, scrolling online, researching into the latest developments and my mind is truly blown away. It is amazing the advances in medical technology and treatments in the matter of 10 years. We hold no resentment in the fact we received the best treatment available at the time of our injuries. But there is a failure to remember that aftercare lasts a lifetime in burns injuries.

From laser treatments, needling techniques, new dressings and surgeries available we must strive to create a system where no Burn survivor is left behind.

Effects of flaxseed oil and olive oil on markers of inflammation and wound healing in burn patients: A randomized clinical trial

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³Department of Bio-statistics, Social Determinants of Health Research Center (SDHRC), School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, , ⁴Cardiovascular Disease Research Center, Department of Cardiology, Heshmat Hospital, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.

Abstract

Objectives: Due to the high cost of burns in developing countries, medicinal herbs can be safe, inexpensive, and effective alternatives to pharmaceutical drugs. In this study, the anti-inflammatory and antioxidant effects of flaxseed oil and olive oil on inflammatory markers were studied to facilitate wound healing.

Methods: 112 patients with a total burn surface area (TBSA) of 20–50% were randomly selected into four groups, including olive oil (OO), flaxseed oil (FO), a mixture of olive oil and flaxseed oil (OF), and control group and received 30g of oils for three weeks. Serum high-sensitivity C-reactive protein (hs-CRP), ferritin and albumin level as inflammatory markers, as well as cholesterol, triglyceride, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) as the lipid profile were explored. Wound healing was assessed by photographing on days 2, 8, 15, and 22 (during three weeks of intervention) and was analyzed in ImageJ software.

Results: The greatest reduction in the level of hs-CRP and ferritin was observed in the OF (-21.38 ± 44.41) (-132.79 ± 165.36), while the lowest reduction was reported in the control group (-36.36 ± 79.03) (141.08 ± 262.36). Compared to the control group, OO significantly increased albumin (0.88 ± 0.65). The reduction of wound healing at the end of the first week of intervention was not significant in the study groups. However, the stereology examination showed significant improvement in wound healing at the end of the second and third weeks in the OF.

Conclusion: Based on the findings, the combination of herbal oils reduces inflammation and improves wound healing, and showed positive effects on the size of wounds in burn patients.

Keywords: Flaxseed oil, Olive oil, Burn wound, Inflammation indices

The use of the LymphaTouch® negative pressure therapy device to improve outcomes in hypertrophic and hypersensitive scarring

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Introduction:

In 2018, our burn centre was provided with a LymphaTouch® device via Dan's Fund for Burns. The LymphaTouch® uses negative pressure therapy to provide myofascial decompression, aid lymphatic drainage and mobilise adherent scar tissue. The therapy service has introduced this modality in both the inpatients and outpatients. Use of the mechanical vibration stimulates cutaneous mechanoreceptors, therefore offering a treatment strategy for scar hypersensitivity.

Purpose of study:

To demonstrate the utility of LymphaTouch® in management of hypertrophic and hypersensitive scars.

Method:

- Scar assessments are done in fully healed burns. The modified Vancouver Scar Scale (mVSS) is used.
- Where scars are found to be hypervascular, hypertrophic or have reduced pliability, LymphaTouch® is instigated.
- The device is set to provide continuous negative pressure at graded settings to avoid epidermal breakdown, typically between 100 and 200mmhg. The negative pressure is used to lift the skin in a circular massage technique, using an emollient. The size of the massage head can be changed dependent on the size of scar being treated.
- Where hypersensitivity is identified, graded vibration between 20 and 80hz is delivered as tolerated.
- This intervention is delivered in weekly clinic sessions alongside a scar management regimen consisting of firm scar massage with an emollient, plus pressure garments and silicone products as appropriate.
- Treatment is discontinued when functional goals are met. Patients are discharged from clinic if the administering clinician deems progression of the scar has plateaued, assessed via palpation and the mVSS. A sample of ten patients receiving this intervention have been taken retrospectively, accessing the burns outpatient clinics between January 2021 and January 2023.

Results:

Of the sample taken, the average pre mVSS on initial assessment was 8.4. On discontinuation of this intervention, the average mVSS was 6.8, demonstrating a difference in score of 1.6. A lower score indicates an improvement in scar cosmesis. Inclusion of vibration alongside negative pressure can re-educate hypersensitive cutaneous nerves to normalise sensation, but there hasn't been an appropriate outcome measure utilised to verify this, this is a subjective patient reported finding.

Discussion/ Conclusions:

Utilising LymphaTouch® in regular treatment sessions can improve the pliability and vascularity of hypertrophic scars, maximising joint range of motion and limb function and allowing return to normal activities. A better aesthetic outcome facilitates optimal psychological recovery and social reintegration. Scar management is multi-modal, therefore we are unable to ascertain the benefit of LymphaTouch® alone on hypertrophic scarring. The mVSS isn't a sensitive outcome measure, it is scored on the worst area of a

scar and may not measure general improvement. In addition, pigmentation changes cannot be addressed using LymphaTouch®, which may negatively impact outcomes. The measure does not account for patients' perceptions of their scarring. A future trial could utilise the Patient-Observer Scar Assessment Scale (POSAS) to more sensitively track improvements following delivery of care.

LymphaTouch® should not be seen as a replacement for patient compliance with a daily scar management routine, best outcomes are demonstrated in patients who diligently follow their scar care regimen.

A day in the life of a rehabilitation patient

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Background/ introduction

In 1941 Archibald McIndoe formed the Guinea Pig Club which made the foundation of the burns rehabilitation service today. After world war 2 members of the royal air force who had sustained war injuries and had undergone two episodes of plastic surgery where signed up to join the Guinea Pig Club. Patients undertook a journey of recovery to return to maximising their daily function. The history of the Guinea Pig Club at QVH is fondly looked back upon today and underpins the work that is carried out in the current rehabilitation service.

The purpose of the project is to make a film to present the current day rehabilitation service at Queen Victoria hospital. Alongside the acute burns service Queen Victoria Hospital has two funded rehab flats which are dedicated to patients with in the London and South East Burns Network. The film describes how the rehab facilities and local area are used within a specifically designed rehab program to achieve person centred goals to facilitate transition from hospital to home.

Methodology

The Burns team and past patients have made a film showing the day in the life of a rehab patient during their stay at QVH. The film shows the unique experience that patients have, including their thoughts and feelings regarding the impact their stay had on them and the benefits it gave them to facilitate returning to home and their daily life.

The film comprises of a personalised 7 day timetable, made in conjunction with the patient and the wider MDT weekly. The film shows how patients are supported returning to social activities by going to East Grinstead, the surrounding areas, or further afield. Some examples are the patient will walk, go by public transport or taxi to the supermarkets to buy food, visit the hairdressers, local shops, cafes, sports centre or even the cinema.

The film shows the depth of rehabilitation that is provided by the burns MDT through a multi modal rehab approach. Its shows their gym sessions, ADL sessions, gardening in our beautiful patient garden and carrying out their personalised programmes. Patients friends and family have the opportunity to be integrated into rehab program.

Discussion/ results

Survivor-ship after a burn injury encompasses physical and psychological rehabilitation which requires a holistic approach. Sharing the functional approach to rehab with burns patients and referring clinicians through creating a film will aim to promote the rehab service and give an insight into what service users can expect. By producing our film and hearing from the patients personally, we can show the rest of the burns community the unique service QVH offers burns patients and the unique benefits they gain from it.

Conclusion

By having a film about the rehab service patients and referring clinicians will be better informed about the rehab service provided at QVH.

Safety of Targeted Temperature Management Following Burn Injuries with Concomitant Cardiac Arrest: A Case Report and Review of the Literature

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Introduction: Burn patients often have mechanisms of injury that include multiple concomitant traumatic injuries and pathophysiologic aberrancies. Cardiodynamic derangements are extremely prevalent in these patients as cardiac stress is one of the hallmarks of the acute response. Additionally, electrical burn injuries represent another mechanism by which cardiac function may be altered. The combination of these factors place burn patients at high risk for subsequent cardiac dysfunction and arrest. Targeted temperature management (TTM) and cooling of burn patients is commonly employed to temporize the thermal changes associated with such injuries. Despite the widespread use of TTM, there is a paucity of literature on the effect and safety of its use in burn patients who undergo cardiac arrest.

Purpose of the study: To provide an illustrative case report and review of the literature on the utility and safety of external cooling following burn injuries with concomitant cardiac arrest.

Methods: We conducted a retrospective chart review of a single case where implementation of a cooling protocol was used for a patient who suffered an electrical burn injury with concomitant cardiac arrest at a major academic burn center in the United States. Relevant literature was reviewed and summarized to provide context for our proposed treatment paradigm.

Results/Discussion: A 21-year-old Caucasian male was admitted to the ICU following an electrocution that occurred when the patient was holding a ladder that contacted an electrical wire (13,000 V). The patient collapsed and was unresponsive. After CPR, defibrillation, and lidocaine administration, ROSC was obtained. The patient was intubated and transported via helicopter after initial stabilization. He was found to have a second-degree burn of his left hand and third-degree burns of his left leg and right foot. Additionally, patient had posturing of upper extremities and up going Babinski reflex which prompted neurologic workup and initiation of TTM, with a goal temperature of 33 degrees Celsius. Precedex was started several hours later for shivering control. Following this, the goal temperature was reached. Upon increasing spontaneous motor activity and command following, rewarming was started at 0.1-0.5 degrees per hour. While initiating rewarming, the patient became hypotensive but responded to an infusion of fluid bolus.

Three days after admission, the patient was taken to the OR for debridement of his right lower extremity burn. He was later taken back to the OR for tracheostomy, PEG placement, and further debridement of his lower right and left extremity burns. The patient also underwent a split-thickness skin graft to his right foot and left anterior calf, and debridement with fenestration of the left medial tibia and Integra placement. For the next eight days, the patient continued to be ventilated and bilateral wounds were kept cleaned and dressed. Nineteen days after admission, the patient had been weaned from sedation and was discharged with no further neurological concerns. His memory and cognition were also improving appropriately. He followed up three days later with no concerning findings.

Conclusion: Cooling of burns may be employed judiciously following burn injuries with concomitant cardiac arrest.

Exploring the similarities and differences of variables collected by burn registers globally: results from a data dictionary review study

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Introduction:

Data collected in a disease register can be utilised in multiple ways, including epidemiological surveillance, outcomes assessment and service planning. Multiple burn registers exist globally, creating a wealth of data with significant potential benefit to the wider burn injury community. Pooling and comparing information collected across different registers increases the value of these datasets by allowing for investigation of rarer exposures and outcomes, tracking of emerging trends and embedding trials, however this requires similar variables to be used in order to ensure the data are reliable and bias is minimised.

Purpose:

The aim of this project is to compare the variables collected in country-wide and inter-country burn registers to understand their similarities and differences.

Methodology:

Country-wide and inter-country burn registers were identified from a recent literature review of active burn registers. Register custodians were approached to participate in the study and asked to share the register data dictionary. A training exercise was completed to ensure researchers extracted variable information to a good level of agreement.

All register variables collected were extracted with identification of required and optional variables. Variables were analysed thematically to understand the most commonly collected topics. Detailed information on variable definition, response options and guidance on method and timing of measurement was extracted for a sample of common topics (age, timing of injury, mechanism, intent, inhalational injury, infection, and survival) and compared across all registers. Calculated variables were excluded from analysis. No patient identifiable data was collected.

Results:

13 registers were included, involving 31 countries. 3 registers did not respond to the study invitation. Inclusion criteria was not consistent across registers, with some additionally including skin-loss conditions and outpatients. 2209 variables were collected across all registers. Median number of collected variables was 107 (range 28 – 1161). Required and optional variable details were included in 11 data dictionaries. The percentage of required variables ranged from 4% to 79%. Variables were grouped into the following broad themes: demographics (236), admission details (142), injury details (557), management (650), complications

(166), outcomes (398), register consent (6) and other (54). Researchers had a good level of agreement when extracting detailed variable information (86%, kappa=0.84). Demographic and basic injury information such as age and timing of injury are similar between registers. They would be comparable between registers with minimal adjustment. The variables for intent, mechanism, inhalational injury, infection, and survival show some similarities but would require more translation and assumptions to be made prior to inter-register comparison.

Conclusion:

This is the first study we are aware of to compare variables across burn registers internationally to understand whether data comparisons may be possible. Burn registers differ in the number of variables they collect. Some register variables were readily comparable. Differences such as inclusion criteria and variable definitions and method of measurement that could introduce bias into inter-register comparisons. A minimum dataset for burn registers with universal definitions and standardised methods of recording and measurement could be developed to facilitate comparisons and utilisation of global data to advance care.

Pinch Grafting--A Historical Review and a 21st Century Reprise: Does a Lost Technique Offer Functionally Invisible Donor Sites and Imperceptibly Healed Recipient Sites?

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¹*University Of California Irvine*

Introduction: Lost to the sands of time is a rudimentary 19th century approach to autologous skin transplantation: Pinch Grafting. We have carefully reviewed the sparse peer-reviewed literature because a modern day outpatient reprise of this technique was highly desirable in our newly refurbished and busy campus-wide wound service. Keen observations of our ambulatory results led us to conclude that 3mm full thickness dermatologic punch skin grafts were behaving in a frankly fundamentally different fashion from traditional split thickness skin autografts. It became incumbent upon us to objectively document the imperceptible healing of recipient sites we have been treating in this fashion.

Methods: Our standardized practice has been developed over the initial 18 months of a renewed wound program at a large academic medical center: standard 3mm dermatologic biopsy punches are used to harvest full thickness skin plugs which are then simply glued to largely unprepared recipient sites with cyanoacrylate medical adhesive. Detailed and complete longitudinal photographic and clinical data were compiled into a wound care registry. As of this writing, we have a registry in excess of fifty patients.

Results: Recipient sites heal by coalescence and confluence of the transplanted autologous skin plugs.

Moreover, the skin morphology of the healing is that of the recipient site, and NOT the donor site. There are no visible patterns nor seams at the healed recipient sites. Donor sites can be effectively rendered invisible by a random pattern of harvest mimicking the patient's natural skin imperfections.

Conclusion: Born of a need to be able to effectively skin graft in relative austere ambulatory outpatient wound clinics, we are pleasantly surprised by what appears to be a WHOLLY different behavior in skin graft healing with this modern day take on pinch grafting. We have now begun to incorporate the technique into our inpatient practices because of these salubrious unique healing attributes. The downrange research to more fully understand what is happening mechanistically, and explain our macroscopic observations is truly wide open, given the prowess and resolution of modern cell biology.

Lyophilized Porcine Bladder followed with Polyurethane Dermal Matrix for Infected Wounds Bearing Exposed Bone or Tendon: A New Lowest Rung on the Reconstructive Ladder?

Jeng J¹, Burton K¹, Joe V¹

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Introduction: Having recently stood up a campus-wide wound service at an academic medical center, an effective and parsimonious approach to an onslaught of open wounds with exposed bone and/or tendon had to be arrived at. We tumbled to an interleaved approach with two products that both hastened bridging neo soft tissue, both admirably infection resistant.

Methods: Adequately prepared wound beds started with sensible debridement, including mechanical "polka-dot" bone burring. Initial bridging soft tissue was achieved with lyophilized porcine bladder. Final wound closure relied on polyurethane dermal matrix and subsequent skin grafting. Careful and complete photographic and historic records were kept in a service registry.

Results: In the first 18 months, this wound service has successfully closed over twenty contaminated wounds with either exposed bone and/or tendons, without resorting to more complex flap surgery. Other pernicious wounds in our queue did require more traditional flap surgery.

Conclusion: Not all pernicious and vexing infected open wounds bearing exposed bone and/or tendon require flap surgery for successful closure. Carefully selected cases can be parsimoniously closed with new techniques that are adept at creating bridging neo-soft tissues, and which are admirably infection resistant.

The effect of burn injuries on brain transcriptomics and metabolomics

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Introduction: Burn patients, especially children, are more prone to mental health conditions following their injury as recently demonstrated using population-based epidemiological studies in Western Australia. The inflammatory response to a burn, coupled to a leaky blood-brain barrier may lead to immune and inflammatory changes in the brain that underlie the long-term increase of mental health hospital admissions observed. However, there is a lack of mechanistic data to examine the effects of burns on the brain causing these mental health problems.

Aim: The aim of this study was to use a mouse model to: 1) To determine the genes in the brain with altered expression following burn-injury, and 2) To investigate the changes in the brain metabolomics after burn injury.

Methods: Mice were allocated into two intervention groups; a burn group that received a burn 7-8% of the total body surface area, and a sham group that received no injury burns. Mice were euthanized three months after their intervention procedure and their brains were collected for 2 “omics” analyses: transcriptomic analysis through RNA sequencing and metabolomic analysis using the High-resolution magic angle spinning (HR-MAS)’s Nuclear magnetic resonance (NMR).

Results: RNA sequencing of the hippocampus revealed significant changes in several genes related to inflammation and neurodegenerative diseases including genes that regulate TNF and cysteinyl leukotriene receptors. Analysis of the cerebellum using NMR also revealed significant changes between groups where metabolites including N-acetylaspartate, myoinositol, lactate, alanine, glutamine, glutamate were all reduced in the cerebellums of mice with burns.

Conclusion: These findings show that non-severe burns can have a physiological impact on the brain even after the burn site has healed, which may explain the increase in mental health hospital admission observed in burn patients. This research may inform future treatments in burn patients to alleviate the burden of long-term mental health conditions in these patients post injury.

Review of subjective outcomes following skinpen microneedling treatment on burn scars

Dudman V¹

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Introduction

Microneedling aims to improve scars by creating micropunctures which restart the inflammation process and prompt tissue remodelling. Our service obtained a SkinPen microneedling device and training for its use.

Purpose of the study

We will describe the initial patients treated with the microneedling device; their demographics, burn size, area treated, subjective comments and POSAs scores following a course of six treatments.

Methods

Patients were selected for treatment by the burn therapy team during therapy or MDT clinic appointments. Data was collected for all patients who received microneedling treatment between September 2018 and 2021. Patients were offered a course of six sessions at bimonthly intervals. Data collected included demographics, burn injury details, needle depth used, analgesia used, pain scores and physical response. Patient and observer POSAs scores were taken pre and post treatment. Subjective comments from the patients were also recorded.

Results / Discussion

27 patients started treatment; 3 were enrolled for laser treatment and therefore microneedling was ceased, 1 patient died after 2 treatments and 2 patients did not attend after 1st and 4th treatments.

16 out of the total 27 patients completed the full course of 6 treatments, 5 patients had 5 treatments.

More than a third of patients had an area of 1% or less treated with the skinpen. Arms and hands were the body areas most frequently treated. The majority of patients started their treatment 1-2 years post burn with a range between 9 months and 5 years.

The maximum needle depth used was 2mm. The minimum and maximum needle depths used for each patient will be described. A pain score of 0-3 was recorded during treatment. There was not a consistent pattern related to needle depth or area treated and pain score. The use of local anaesthetic cream is reported, again with no correlation between pain relief used and pain score.

Twenty patients had pre and post treatment Observer POSAs scores. Seventeen of these showed an improvement in the scar, with the largest difference being 26 points. Nineteen patients showed an improvement in the Patient POSAs, with nine patients recording a difference over 20 points. The subjective comments gathered from patients were mainly positive and will also be described. Two patients reported no change to aspects of the scars, however no worsening of scarring was reported.

Conclusion

The subjective results obtained demonstrate that patients and clinicians found the microneedling treatment to be beneficial to improve their scars, particularly the softness and texture of the scar. Although some pain was recorded during the treatment, there were no reported issues with discomfort or complication following each session and pain was managed and tolerated for the duration, no treatments needed to be stopped due to pain.

Further evidence is required to determine the most effective needle depths to use for burn scars. Objective scar measures such as a cutometer or ultrasound could be beneficial to demonstrate the effect of microneedling on burn scars.

Establishing burn registers: the role of digitisation of routinely collected data globally

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Introduction

Burn registers collect clinical data about patients that can be used for surveillance, service provision, quality improvement, prevention, and evaluation of interventions. Burn registers are strongly concentrated in high-income countries, most likely due to ethical, regulatory, technological, and economic issues. A quarter of burn injuries and deaths occur in South Asia, the vast majority in India. There is no national burn register and prevention is hampered by poor surveillance systems. Many burn units in low- and middle-income countries collect handwritten data on patients including demographics, injury details, and disposition in a collated form. These data are typically used for audit purposes but could be used more broadly if in a digital format to enable easier analysis. The quality of such data should be appraised before scarce resources are allocated for digitisation.

Aim

The aim of this project was to develop a method to judge whether handwritten burn registers should be digitised, and how to complete digitisation such that the data could be used for surveillance purposes. This is exemplified by sharing the experience from a tertiary government hospital burn unit in south India.

Methods

Register books were reviewed to ensure they could be retrieved, estimate the extent of missing data, and appraise if the variables were relevant for surveillance purposes (Figure 1). Process mapping of burn patient presentations was completed to understand how register data is collected, and potential biases in these data. Burn register cases were compared to casualty data to assess the case ascertainment rate. Handwritten registers from February 2016-2022 were retrieved from medical records. Each page was scanned and identifying information redacted. Scans underwent quality checks and were stored securely. An online data entry form was developed. All data underwent double verification.

Results

Review processes strongly supported resource allocation for digitisation – registers were retrievable, missing data was estimated at under 5%, process mapping suggested data were reliable, and captured 95% of casualty cases. 1930 presentations were recorded in the registers, representing 0.84% of all hospital admissions. 388 pages were scanned with 4.4% requiring rescanning due to data quality issues. Iterative development of the data entry form allowed inclusion of observations made by the data entrant (e.g. overwriting of intent, likely linked presentations). All records were verified by proofreading with errors found and corrected in 0.33% of the fields. A further 15% of randomly selected records underwent an independent second round of verification. This estimated there to be errors remaining in 0.06% of fields.

Conclusion

Little guidance exists on how to utilise handwritten routinely collected data for surveillance purposes. We have shown that digitisation of a handwritten burn register can be completed to a standard comparable with prospective electronic registers. It is essential clinicians and data analysts are familiar with the raw (handwritten) data to ensure all meaning can be extracted during data entry. This robust and reproducible method can be applied to any type of handwritten register to ensure a high degree of reliability of the data once digitised.

The roles of psychological flexibility and self-compassion in appearance distress following burn injuries: A multi-centre cohort study

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Introduction: Appearance distress following burn injuries is common. Few studies have prospectively explored the role of psychological variables in appearance distress; none conducted in the UK. Psychological flexibility and self-compassion may be important targets for reducing appearance distress. Psychological flexibility involves openness to difficult internal experiences (e.g., emotions, thoughts), being in the present and living a valued life. Self-compassion involves self-kindness, mindfulness and acknowledging that everyone experiences difficult internal experiences. **Purpose of the study:** To explore the roles of psychological flexibility and self-compassion in appearance distress following burn injuries. Lower psychological flexibility and self-compassion, measured during hospital admission, were hypothesised to predict increased appearance distress two-months later. **Methods:** A multi-centre prospective cohort study was conducted. During hospital admission, measures of appearance distress, perceived noticeability (how visible patients believe their injuries to be to others), psychological flexibility, self-compassion and post-traumatic stress disorder (PTSD) symptoms were completed. Questionnaires were repeated two-months later. Demographic and burn injury information was also collected. **Results:** 175 adult burns patients (117 male; 58 female) participated. Appearance distress was found to increase between hospital admission and two-months follow-up. Correlational analyses revealed that cross-sectionally at hospital admission and two months later, lower levels of both psychological flexibility and self-compassion were associated with increased appearance distress. These relationships remained when controlling for age, gender, ethnicity, percentage total body surface area (%TBSA) burnt, perceived noticeability and PTSD symptoms. Furthermore, lower levels of psychological flexibility and self-compassion at hospital admission were associated with increased appearance distress two months later, when controlling for the same variables. Multiple linear regression analyses revealed that, during hospital admission, psychological flexibility and self-compassion explained an additional 13.3% of the variance in appearance distress over the covariates. In this model, (female) gender, perceived noticeability and psychological flexibility were statistically significant predictors. There was also a trend towards self-compassion being a statistically significant predictor. Two months later, psychological flexibility and self-compassion measured during hospital admission explained an additional 9.6% of the variance in appearance distress over the covariates, and (female) gender and psychological flexibility were statistically significant predictors. Adding appearance distress during hospital admission explained a further 10.2% of the variance. Appearance distress measured during hospital admission was the only statistically significant predictor in this final regression model. **Conclusion:** Lower psychological flexibility and self-compassion are associated with increased appearance distress. Psychological flexibility measured during hospital admission was predictive of appearance distress over time although not over the effect of appearance distress during hospital admission. It is important to screen for appearance distress during hospital admission to identify patients at risk of appearance distress over time, as this seems to worsen. However, low levels of psychological flexibility and, to a lesser extent, self-compassion play a role in explaining increased appearance distress. Psychological interventions that, in particular, enhance psychological flexibility may therefore be beneficial for reducing appearance distress in the early stages following burn injuries.

Priorities in Global Burns Research: Preliminary results from the first priorities setting survey.

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Research prioritisation reduces research waste and ensures research outputs are relevant to patients, carers and clinicians. In burns care, there is a lack of high-quality evidence to support consensus on best clinical practice. This leads to a variance in patient care and outcomes, especially in low-resource settings and countries where the incidence of burn injuries is higher. To our knowledge a research prioritisation exercise has not been conducted in burns care. The aim of this work is to agree the top ten research priorities for burns care globally using validated methodology.

[Purpose of the study] This James Lind Alliance (JLA) National Institute for Health Research (NIHR) Prioritisation Setting Partnership aims to identify the top ten most important unanswered questions in global burns care to ensure future research addresses topics of relevance to key stakeholders. There are several steps in this process. Here we report the preliminary results from the first international survey to identify importance questions.

Adopting validated JLA methodology, a preliminary online survey was launched in March 2022 to gather research uncertainties from patients, carers and. The survey was available in ten languages and was open until September 2022. Survey responses were professionally translated into English and analysed using deductive thematic analysis to identify unanswered questions. Thematic analysis was undertaken by the international Steering Group, which comprises of patients, carers and clinicians. A second online survey (planned for 2023) and international meeting will determine the top 10 priorities.

The survey was accessed by 1833 respondents from 89 countries across five continents. Following data cleaning, 1617 respondents from 79 countries were included in analyses. These respondents were 357 patients, 203 carers and 1052 clinicians. Most responses were received from Vietnam (n=332, 21%), the United Kingdom (n=175, 11%) and the United States of America (n=131, 8%). The majority of respondents were female (n=952, 59%) and were aged 30 to 39 (n=427, 26%), although 88 (5%) of respondents were under 18 and 55 (3%) were over 70. Most burn injuries were caused by flame or fire (n=331, 59%), were over 30% total body surface area (n=203, 36%) and had occurred within less than 1 year of survey completion (n=203, 36%). The majority of clinician survey respondents were surgeons (n=351, 22%), nurses (n=289, 18%) and physiotherapists (n=98, 6%). Overall, 40 different professions associated with burns care completed the survey. Qualitative deductive thematic analysis of free text responses obtained in the surgery is currently underway to identify a preliminary longlist of unanswered questions which will supplement the findings and be included in a second international survey.

The first phase of the NIHR JLA Priorities in Global Burns Research survey has been completed. Respondents represent a wide range of backgrounds and professions from many countries and resource settings. Future work will identify the top ten most important unanswered questions in global burns care.

Achieving optimal pre-operative nutrition in adult burns patients, in both an inpatient & outpatient setting, by using a pre-load isotonic carbohydrate drink.

O' Reilly M¹

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The Nursing Times (2014) has described the process of being fasted, or nil by mouth (NBM) whereby a patient becomes “restricted from eating and drinking” or they are having a “period of starvation” (NICE, 2020), prior to undergoing a surgical procedure that requires a general anaesthetic or sedation.

The NHS have set fasting standards and as a blanket rule, it is largely accepted within the NHS that pre-operative patients are kept NBM of solid foods for 6 hours and 2 hours for clear fluids before surgery (NHS Choices, 2020).

Despite the NHS guidance, we still see variance in our local practice. Unsurprisingly this causes confusion, not only for the patient, but also the clinical staff, who often opt for a ‘better safe than sorry’ strategy. This in turn leads to prolonged periods of starvation and the negative consequences for a patient being without fluid and sustenance (NICE, 2020).

I recently completed an audit, including ten adult inpatient and outpatient patients requiring surgery under general anaesthetic and recorded their fasting times. The average food fasting time was 18hr 10min and the average fluid fasting time was 9hr.

What can we do to help improve pre-operative fasting for our patients?

I wish to introduce pre-load isotonic carbohydrate loading drinks to our pre-operative patients as a gold standard of practice. Pre-Load is typically taken in sachet form, mixed with 400ml water per sachet; x2 sachet the evening before surgery and x1 sachet the morning of surgery. Pre-load can be used up to 2 hours before surgery, without impacting the patient’s fasting regime pre-operatively.

Pre-Load has many benefits, including:

- ☐ Improves patients’ well-being & comfort pre-operatively (thirst, dehydration etc.)
 - ☐ Reduces post-operative nausea & vomiting symptoms
 - ☐ Improves post-operative muscle function
 - ☐ Helps to reduce insulin resistance & inflammatory stress response
 - ☐ Minimises protein loss
 - ☐ The patient arrives in a metabolically fed state pre-operatively
 - ☐ Rapid return to normal function e.g.: eating, drinking, mobilising
 - ☐ Reduces post-operative complications and in turn, reduces patient length of hospital stay
- (Gustafsson, 2011., ERAS, 2019 & NHS Scotland, 2020)

Isotonic drinks are liquids that contain similar concentrations of sugar and salt that are found in the human body. Isotonic drinks are designed to quickly replace fluids that are lost from the body during activities such as exercise and fasting, with an increase of carbohydrate (The British Soft Drinks Association 2019).

Nestlé (2022) have described their pre-load pre-operative product as; “Preload™ is a powdered, neutral-tasting carbohydrate loading drink mix for the pre-operative dietary management of patients undergoing surgery”.

Pre-operative carbohydrate loading has also been recognized as a contemporary element to enhanced post-operative recovery by the Enhanced Recovery After Surgery Society Advisory Council (ERAS, 2019).

Significant improvements can be made to our pre-operative patients by optimising their pre-operative nutrition, this in turn will contribute to better patient outcomes and experiences.

A proposal of updates to the (2010) LSEBN adult psychosocial training

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The original LSEBN Adult Psychosocial Training programme remains the only burns-specific adult psychosocial training package freely available to burns services worldwide. There has been broad uptake across British burns services and it has been delivered to hundreds of burns professionals across London and the South East, and beyond. It is argued that more than a decade later the time has come to review, refresh and revise the material.

Feedback from previous students, personal experience of teaching the material for 12 years, developments in our understanding of psychosocial factors and discussions with the LSEBN Psychosocial Forum have been influential in this process.

Proposed changes aim to achieve the following:

Improve the flow of sections within modules

Removal of pre-prepared case examples to encourage students to bring their own experiences into the training

Stronger messaging about human resilience - problems as the exception rather than the rule

Change SPEMS to SPECS as a way of 'seeing' patient needs

Changes to section on working with difference, not different cultures, to expand student perspective

Addition of Burns Myths

Inclusion of various models of grief and loss

Update trauma section to include ICD-11 definition

Replace 321 Go with Explain Reassure Distract

Update section on working with self-injury and making explicit links to local policies on mental health care

Strengthen self care section and inclusion of a short exercise to embed this.

One trial of the new material with a cohort of 8 students has been conducted and initial feedback has been positive.

The initial plan will be to share the changes with psychosocial colleagues and seek their feedback on the proposed changes. Funding may be sought for professional design, formatting and production. In future it may be possible to consider identifying specific sections for localisation and customisation. Although much of the content is applicable across burns patients, the present content is based on well-resourced, British, inpatient burns services. A design that could be customised would increase the potential utility of the training for international burns populations and those outside of burns-specific inpatient settings.

Educating on burns management in Accra, Ghana.

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Introduction

In Scotland there is an incidence of 500 burn injury admissions per year, of which 5% are major burns. As a tertiary burn centre, we treat these burns patients along with cases with major skin loss from dermatological conditions. In November 2022 a team of anaesthetists from our hospital spent a week in Korle Bu Teaching Hospital, Accra, Ghana; anaesthetising, teaching and exploring the different practise in the management of major burns.

Purpose of the study

To examine the current practise of doctors in Accra in relation to burns management and share knowledge from our experience through teaching sessions and data collection.

Methods

We provided a teaching session to the doctors in Accra. This involved initial assessment and treatment strategies, examination of airways, grading of inhalation burns via bronchoscopy and ICU management, that could impact on the future care of patients. Staff were then asked to complete a questionnaire on their current practise to determine; how often they treated major burns, the inotropes and analgesia used, issues they encounter and if they had ever received formal teaching on burns management.

Results

A total of seventeen doctors with up to 10 years experience completed the questionnaire. 59% treated burns patients annually with only 18% monthly and 88% had received formal teaching on the management of burns. The most common analgesia noted was paracetamol followed by ketamine by 65% of doctors, with lower use of morphine by only 29%. The inotropes of choice were noradrenaline followed by adrenaline by 82% and 65% of the sample respectively. The most common issue of concern stated was infection (82%), followed by ventilation (59%) then pain (53%). Nutrition, temperature regulation and renal failure were acknowledged by 35% each. Following our teaching session 82% of doctors felt that their knowledge had improved and they would be more confident in applying this knowledge in future practise, with all stating it was relevant to them.

Conclusion

It was interesting to gain insight in the management of burns patients in Accra. The issues faced by the staff are very similar to those we encounter in our department. It is known from the WHO that the majority of deaths from burns occur in low- and middle-income countries therefore our visit was to share knowledge based on experience and open up a line of communication to support the best possible outcomes for patients. In the UK we benefit from performing research alongside treating patients and the frequency of our admissions allows us to share this understanding. We would hope to continue this relationship to explore why they practise in certain ways, if it is resource dependant or lack of appreciation. Since returning home the doctors of Accra have stayed in contact to enquire further about our practise. This enthusiasm not only confirms the benefit our trip but also hopefully will impact the patients with burns in Ghana for the better.

Randomised controlled trial for treatment of hypertrophic burns scars with the pulsed dye laser: Early Laser for Burn Scars (ELABS) update

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Background & Objectives

Hypertrophic scars are abnormal scars that occur following burn injury. This study will assess the effectiveness and cost-effectiveness of treating hypertrophic burns scars with pulsed dye laser (PDL) at an early stage of scar formation. The objective is to improve the Quality of Life for the patient by both improving the appearance of, and reducing the impact from, burn scarring. The study will also report the patient-reported experience of the scar treatments involved in the study both in the laser group and control group.

Study design and Method

This is a 3 year NIHR(RfPB) funded parallel-arm randomised, controlled trial to compare PDL and standard care against standard care alone. The difference in primary outcome is the patient-rated part of the POSAS scale and will be measured between baseline and 6 month follow-up. The recruits will be within 3 months of healing from a burn injury greater than 1% of body surface area showing a potential for hypertrophic scarring. 150 patients will be recruited in a multi-centre study across the UK to achieve a sample size of 120. Psychological and psycho-social impact will be evaluated using validated scales, CARE and SF-12. A qualitative telephone survey will identify themes in the patient experience of the various scar treatments and their effectiveness, as well as participation in the study. The research output may contribute towards NICE guidelines and a robust PDL treatment protocol on the treatment of burn scars.

Discussion

This presentation will outline the study design and the progress on recruitment to-date. The recruitment period is due to complete at the end of May 2023. Preliminary results on recruitment the consort diagram and the analysis plan will be shared.

Evaluation of the ability of native probiotic *Lactobacillus* strains to produce antibacterial peptides, inhibit biofilm formation and cell attachment against clinical isolates isolated from burn wounds and diabetic foot ulcers

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Introduction: Lactobacilli have been considered probiotic organisms due to their potential human health properties.

Aim: This study aimed to evaluate the capabilities of native probiotic *Lactobacillus* species to produce antibacterial peptides and inhibit biofilm formation and cell attachment against bacterial strains isolated from burn wounds and diabetic foot ulcers.

Method: Clinical isolates were obtained from our previous studies (IR.GUMS.REC.1398.410) (IR.GUMS.REC.1398.092). A total of 100 clinical samples were collected from patients. The pathogens included isolates of *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli*, and *Enterococcus*. Also, native probiotic strains isolated in a previous study (IR.GUMS.REC.1398.016) were used. These strains were evaluated for phenotypic bacteriocin production. The agar spot test method was used to evaluate the ability of lactobacilli to produce antimicrobial compounds. Then the anti-biofilm ability of lactobacilli was evaluated by the Microtiter plate assay method. The HFSF-PI3 cell line is used to investigate the binding of lactobacilli and the ability to compete with pathogens isolated from wounds. Then the number of bacteria was determined by colony count.

Results: The Agar-spot test showed that *Lactobacillus* bacteria have a high ability to inhibit *Pseudomonas aeruginosa* compared to other genera. This result was also observed in the Microtiter plate assay test, and *Lactobacillus* effectively inhibited biofilm formation by *P. aeruginosa*. The results of the *Lactobacillus* attachment test to the HFSF-PI3 cell line and the ability to compete with wound pathogens showed that *Lactobacillus* has a higher ability to inhibit the binding of *Pseudomonas* to this cell line (Table 1).

Conclusion: *Lactobacillus* strains may represent an alternative bio-control strategy against skin infections with their antimicrobial, anti-biofilm, anti-quorum sensing, and antioxidant activity.

Effect of probiotic administration on Inflammatory Responses in thermal burns

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Objectives & Introduction: It can damage the natural intestinal barrier following severe burn injuries. Oral probiotics' positive effects on the innate immune system or intestinal epithelial layer are proven. This research aimed to evaluate the role of probiotics on plasma inflammatory changes and bacterial colonization in the burned wound after high-grade thermal trauma.

Methods: This double-blinded randomized controlled trial was conducted on 80 patients with a 20-50% burn percentage. Patients were allocated to two groups based on four blocks randomization model.

Intervention and control groups received daily LactoCare and placebo capsules for 14 consecutive days. Obtaining demographic data, burn and gastrointestinal symptoms were registered by filling out a questionnaire. Additionally, plasma levels of highly sensitive C-reactive protein(hs-CRP), IgA, absolute neutrophilic, and lymphocytic count were measured cumulatively four times before and after the intervention.

Results Considering eligible data, following the study period analysis showed significant mitigation of inflammatory status in probiotic receivers. The hs-CRP reduced following probiotic (21.38 ± 44.45) consumption compared with placebo (-36.36 ± 79.03) intake ($P < 0.001$). Also, the plasma level of IgA significantly decreased in the intervention group (0.88 ± 0.65) than in the control group (0.79 ± 0.18) ($P < 0.001$). Wound cultures showed no significant difference between groups, although the incidence rate of bacterial colonization was slightly lower after using probiotics ($P = 0.159$). Regarding wound healing, data illustrated that probiotics could accelerate wound healing after 14 days of regular consumption ($P < 0.001$).

Conclusion: Probiotics have advantages for mitigating inflammation and wound healing following severe thermal burn injuries. Trends toward Improvement Immune system by increasing IgA level and lymphocytic count and possible Reduction of wound area with exogenous probiotic administration in patients with burns suggest that further investigation in larger sample size is necessary to corroborate our initial, promising findings.

Keywords: Burn; CRP; IgA; Probiotics; Wound healing

Base Deficit, Serum Albumin Level And C-reactive protein-to-albumin ratio Can Be Used as Predictor Factors For prognosis in severely burned patients

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Background: Despite medical advances in burn treatment, patients face complications such as sepsis, ARDS, and organ dysfunction. Since the early prediction of sepsis and acute inflammation and its control is essential to predict burn outcomes, this study aimed to investigate the predictive role of base deficit, serum albumin level, and CRP/Alb ratios for prognosis in severe burn patients.

Materials and methods: This Retrospective study was conducted on burn patients between 20-80 % TBSA admitted to the burn intensive care unit at Velayat University Hospital from April 2018 to April 2021. Serum albumin level, Base Deficit, and CRP/Alb ratio as predictive factors of patient mortality were determined in the 1st, 3rd, 5th, and 7th days of admission.

Results: A total of 209 patients were accessed, and 195 were enrolled in the final analysis. Average serum albumin in the survived group was 3.05 ± 0.56 and in the non-survived group 1.89 ± 0.69 gm./dL, while the base deficit was 3.36 ± 2.15 , 10.62 ± 1.71 , and CRP was 20.95 ± 29.33 , 54.62 ± 46.29 g/dl respectively, so Significant differences were in Alb, CRP, Base deficit, and CRP/Alb ratio between survived and non-survived groups ($P < 0.001$). Multivariate logistic regression showed that with the decrease of serum albumin level and increase of CRP/albumin ratio, the mortality rate of patients increased significantly ($P < 0.05$).

Conclusion: A decrease in serum albumin and an increase in CRP/Albumin ratio frequently developed in patients with burn injuries, which can lead to several physiological alterations in cellular function and correlate with burn patient outcomes. The systematic use of these indexes could help to identify those patients with higher risk.

Keywords: Burns, Serum Albumin, C-reactive protein, Base Deficit, Prognosis

Foot burns: a problem exclusive to diabetic patients?

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Introduction

Foot burns require prompt assessment and management. Despite their comparatively smaller total body surface area, foot burns are associated with a considerable impact on the physical, psychological and social wellbeing of an individual. Due to their propensity for infection and subsequent delay in wound healing, they often require hospital admission. The National Burn Care Referral Guidance (2012) reiterated the importance of discussing all foot burns with specialist Burns Consultants.

Aim

To investigate the characteristics and outcomes of all foot burns reviewed at a regional burns centre.

Methods

The International Burn Injury Database (iBID) was used to identify all foot burn referrals to a regional burns centre over a period of four months (July to October 2022). A retrospective chart review was conducted to collect demographic, referral pathway and management data. Subgroup analyses on patient admission, presentation time and diabetic/peripheral neuropathy patients were undertaken.

Results

A total of 35 patients, with a median age of 52 years (16 – 93 years) and foot total body surface area (TBSA) of 0.5% (0.2% - 0.7%), were referred to our centre. Almost two in every three patients required admission and the median length of inpatient stay was 4 days (0 – 29 days). Patients presenting to a healthcare service more than 24 hours following their injury, were classified as “late presenters” and accounted for 34.3% of the population. Although 68.7% of foot burn referrals were from external hospitals, all cases were reviewed on the same day of referral. Infection was suspected in 46% of cases, whom all required a course of intravenous antibiotics. Of those who required an inpatient admission, 65.2% had a documented positive wound swab and 69.6% required intravenous antibiotic treatment ($p < 0.01$). Late presentations were more likely to have infected burns and require intravenous antibiotics. Surgical intervention for excision of the burn was opted for in five patients. A total of 28.5% of patients had risk factors such as diabetes and/or peripheral neuropathy. There was no statistically significant difference in any of the investigated parameters when this group was compared to the rest of the cohort.

Conclusion

Patient morbidity and mortality secondary to foot burns and associated complications can be reduced by early presentation to a healthcare service and referral to a specialist Burns department. Historically, previous articles have suggested that diabetic patients have a greater risk of complications following foot burns. However, our study emphasises the importance of prompt assessment and appropriate management in all cases. Sustained delivery of training to patients, in-house burn care providers and referring units will drive local protocols and optimise patient outcomes.

Combination therapy of inverse agonist of vitamin D receptor (VDR) nanogel and Lipocalin-2 engineered mesenchymal stem cells improve wound healing in rat model of excision injury

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Purpose: Currently, several disorders including burns, trauma, excisional injury, diabetic wounds, and bedsores threaten human health. Application of mesenchymal stem cells (MSCs) is recommended for the treatment of skin disorders. However, because of oxidative stress and inflammation after a skin injury, survival of transplanted MSCs is low which in turn negatively affects the efficiency of the MSCs-based therapy. In an attempt to address the aforementioned challenge and introducing a novel potential therapeutic strategy, we employed combination therapy by Lipocalin (Lcn2)-engineered MSCs and an inverse agonist of vitamin D receptor (VDR) nanogel in a rat model of the excisional wound.

Methods: First, human Umbilical Cord MSCs (hUC-MSCs) was transfected by a recombinant plasmid encoding Lipocalin 2 (Lcn2) gene. Next, a combination of an inverse agonist of vitamin D receptor (VDR) nanogel and the engineered MSCs was co-applied on wound in rat model of excision injury. Finally, the improvement of wound healing in experimental groups was evaluated by photography and histological assessments (hematoxylin and eosin staining).

Results: Our findings revealed that the repair rate was higher in the group received combination therapy comparing to control groups. Notably, nanogel+Lcn2-MSCs showed significantly higher wound contraction rate compared to control group at all time points (p value< 0.001). Furthermore, wound healing rate was 95%, 14 days after surgery, and 100% after 21 days in the treatment groups. Our results also revealed that the combination therapy improved and accelerated the wound healing process.

Conclusion: Our findings suggest a novel potential therapeutic strategy i.e. Lcn2-engineered MSCs and inverse agonist of vitamin D receptor (VDR) nanogel for wound healing. However, further preclinical and clinical studies are required.

Keywords: Mesenchymal Stem Cells, Inverse agonist VDR, LCN2/NGAL, Wound healing, Excision injury

MANAGEMENT OF MRSA wounds: Topical bacteriostatic dressing vs triple ointment dressings

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¹BURN CARE CENTRE PIMS

Background: Burn wounds are prone to infections. The morbidity increases with MRSA infections.

Materials and methods: The case series was followed from January 2021 to January 2022. Inclusion criteria included burn wounds in adult males aged more than 15 years with TBSA 5-15%. 60 sample size which was divided into two groups of 30. One group was treated with triple ointment cream with oral linezolid and other group with topical sorbact dressings.

Results: Sorbact group had MRSA clearance of 95% as compared to 70% in linezolid group. The average change of dressings was 2 days for linezolid as compared to 4 days for sorbact. Treatment prices were lower by 15% for sorbact group. The mean duration of treatment was 18% shorter for sorbact group. The pain experienced during dressing change was same. Overall satisfaction with the treatment was 10% higher for the sorbact group. 18% patients in the linezolid group experienced dyspepsia and arthralgia associated with the use of antibiotics.

Conclusion: topical bacteriostatic dressings have better outcome in terms of infection control and are more pocket friendly.

Treatment of exfoliative skin disorder in a burn centre of LMIC.

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Introduction: Steven Jhonson syndrome and toxic epidermal necrosis is a rare disorder caused by the peeling of the epidermal skin appendages of patients in reaction to some drugs or a viral illness. The allergic reaction involves the skin, mucosal surfaces of the mouth, nostrils, eyes and even the perianal regions. As the area involved is the whole body, they are treated as almost 100% burns. They are a challenge to treat due to the lack of resources.

Materials and methods: this study aimed at the management of the patients who were reported with deep dermal skin involvement secondary to severe drug reaction. 50 patients were reported in this retrospective study which spanned over 4 years from 2017 to 2021. All these patients were treated in Burn Care Centre, Islamabad. The patients were analyzed for age, gender, cause, area involved, total length of stay and general outcome of patients.

Results: the patients were resuscitated initially with a target output of 1 ml/kg/hr. The patient wounds were washed on daily basis with normal saline and liquid paraffin was applied. The deep wounds were dressed in triple ointment cream and paraffin gauzes. Steroids were given in the initial stages which were tapered off. Nebulization and perianal care was advised. The mean length of stay was 18.2 days. Patients presented within 3 days of developing rashes. Mean age of presentation was 12 years while only 15 patients who presented to us were male. The mortality rate was 2% and all patients were discharged from the centre with open wounds. The causes were identified to be antibiotics in pediatric group, DMARDS and methotrexate in adult group.

Conclusion: exfoliative skin disorders are treated on the lines of major burns. The treatment regime used in this study has a low mortality rate with good wound care. The results in this study are comparable with the other studies.

First, do no harm: a survey of patient's perceptions of their split-thickness skin graft donor sites.

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Introduction

The split-thickness skin graft (STSG) donor site is our commonest iatrogenic injury and as such we focus on minimising it. Modifications to our practise which we believe help include the harvest of super-thin STSGs, with 0.003-0.005 inch (0.08-0.13 mm) being our commonest dermatome settings.

Objectives

A patient-reported survey and retrospective notes review was performed to determine patients' opinions and examine factors that may contribute to a favourable donor site.

Methods

A questionnaire was designed following patient and staff feedback and consensus. All patients with acute burns coded as having an operation involving a STSG from 01/08/2020- 31/07/2021 with mobile phone numbers were included. A link was sent via text message to the questionnaire using RedCap (a secure web-based application).

Patient demographics were collected from electronic notes. Patient responses were statistically analysed and logistic regression was performed to explore which contributing factors led to an improved experience of the donor site.

Results

The questionnaire was sent to 250 patients, of whom 107 (43%) responded. Responders were comparable to non-responders in the following: days from burn to completing the survey (median 617, range 392-817 days); %TBSA (median 2%, range 0.1-55 %TBSA), male to female ratio (69% : 31%). Responders were significantly older than non-responders (median 45 v. 36, range 18-91 years).

Concerning early donor site issues, itch was a problem in 51% (n=52) of patients and was more likely in younger patients. Pain was a problem in 48% (n=49) of patients, and more likely with larger burn size. Less common problems were leaking donor sites, wound breakdown and over-granulation.

At the time of the survey, 70% (n=73) responders reported their donor site looked "the same or about the same as my normal skin". Of these, 62 reported how long it took for this to happen, and it equates to a third (33%) looking like normal at 6 months and half (52%) looking like normal at 12 months. For the 32 patients who reported their donor site looking abnormal, 72% were not bothered by it. Only 7 % of patients wished their donor site had been sited elsewhere on the body.

At the time of survey completion, increased, decreased or mixed pigmentation at the donor site was reported by 33% (n=35) patients. Hyper-vascular donor sites were reported by 30% (n=31) patients. Raised

or uneven feeling donor sites were reported by 19% (n=20) patients. Firm or stiff donor sites were reported by 13% (n=14) patients. Altered sensation was reported by 11% (n=12) patients.

Patients whose grafts were harvested 0.003-0.005 inch were significantly more likely to have normal sensation, normal stiffness, be less raised and itch less than those whose grafts were harvested 0.006-0.008 inch.

Conclusions

This survey gives important information on patients' experiences of donor site morbidity that may form part of an informed consent process and suggests that very thin grafts (<0.005 inch) provide a superior donor site experience for patients.

Qualitative analysis of the psychological experiences described by burns, plastics, and reconstructive surgery patients from the perspectives of the cognitive and metacognitive models

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Background: Burns and other injuries requiring plastic and/or reconstructive surgery (BPRS) are life changing, often unexpected, and require extensive medical treatment. BPRS patients are more likely to attract psychiatric diagnoses such as depression, generalised anxiety disorder, and post-traumatic stress disorder and have higher healthcare use, increased mortality, and a poorer quality of life. Despite recommendations for psychological screening and intervention as part of aftercare, no research explores the applicability of psychological models to BPRS patients. Cognitive behavioural therapy (CBT) is a gold-standard treatment in mental health and is recommended by NICE for many conditions, however, some research suggests there are smaller benefits of CBT in people with comorbid physical health conditions than in those without. Adaptations to CBT, such as incorporating acceptance techniques, have attempted to improve the efficacy within this population. Metacognitive therapy (MCT) is an alternative transdiagnostic therapeutic approach which works on reducing repetitive negative thinking patterns of worry and rumination. MCT is an effective treatment in mental health patients and is promising in reducing symptoms of anxiety and depression in people with comorbid physical health concerns such as cancer and cardiac rehabilitation patients.

Aims/purpose: The present research aims to explore the psychological experiences (that is the thoughts, feelings, and coping behaviours) of BPRS patients following their injury, and to explore whether the underpinning concepts of the cognitive and metacognitive models can be elicited from these accounts.

Method: Eleven patients were recruited from a BPRS psychology service and semi-structured interviews were conducted focussing on their post-injury psychological experiences. Thematic analysis was used to analyse the data.

Results: Patients described a range of emotions including low mood, anxiety, anger, guilt, and loss. All patients described how they engaged in repetitive negative thinking (worry, rumination) and engaged in a wide range of coping behaviours such as distraction and thought suppression. Concepts underpinning both the cognitive and metacognitive models were successfully elicited from BPRS patients' accounts. From the perspective of the cognitive model, there were examples of all ten pre-specified types of distorted thinking and patient talk fitted problem-specific cognitive models, however this relied on highly subjective judgements in categorising distortions. Further, some concerns had a basis in the clinical reality of the patient; in clinical practice the cognitive model would attempt to challenge the validity of these concerns, which may be unrealistic or even inappropriate. In application of the metacognitive model, it was found that patients engaged in all aspects of the cognitive attentional syndrome (i.e. repetitive negative thinking, inflexible attention, and maladaptive coping strategies) and endorsed both positive and negative metacognitive beliefs. There was less subjective judgement about the processes identified and no tension evident with the validity of patients experiences.

Clinical implications/conclusions: The metacognitive model may offer potential theoretical and practical benefits in clinical practice and thus the feasibility and acceptability of MCT for BPRS patients should be investigated further.

Burn Injury Assessment Study (BIAS)

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Introduction:

Appropriate treatment of burn wounds requires accurate wound assessment; however, even expert clinicians are only accurate 60-80% of the time in judging burn depth.

Purpose of Study:

This study was undertaken to estimate the accuracy of burn wound assessment by burn care professionals from still images.

Methods:

This was an IRB-approved, prospective cohort study. A tablet based digital interface was used to obtain participant consent, provide instruction to participants, allow participants to complete a 10-item questionnaire, and allow for participants to indicate non-healing burn wounds using polygon software. There were five burn wounds provided with brief case history. Previously, each of the five wounds presented in the study had a true burn depth assessment, determined by a consensus panel of study investigators using a 21-day healing assessment. Performance metrics, including accuracy, sensitivity, specificity, area positive predictive value (PPV), and area negative predictive value (NPV), were calculated for the whole cohort as well as subgroups.

Results:

One hundred fifty-eight (158) healthcare providers enrolled. There were 50 physicians, 14 APPs, 63 nurses, 24 therapists, and 5 paramedics. The mean years of experience was 9.96 ± 9.49 in burn care, with 70% working at a verified burn center. Providers from all regions of the United States were represented: Eastern Great Lakes (4%), Midwestern (6.5%), Northeastern (22%), Southern (53.5%), and Western (14%). Participants recommended surgery in 18.3% to 37.5% of the superficial and superficial partial-thickness burn wounds and did not select surgery in 56.1% to 81.2% of deep partial-thickness burn wounds. Performance measures were not associated with years of experience, but provider role was significant with an APPV of $p=0.039$.

Conclusions:

This study is the largest and most comprehensive that examines burn wound assessment to date. Clinicians that treat burns have an opportunity to improve upon burn wound assessment, which will ultimately decrease patient morbidity. Multiple surgical fields have adjunctive assessment devices, and the field of burn care would benefit from a device that augments accuracy in treatment decisions.

Rise of the (Learning) Machines: Artificial Intelligence for the Assessment of Adult Thermal Burns

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Introduction:

In the US there are 450,000 hospitalized burns each year that require assessment by a trained medical professional with over 1.1 million seeking medical assistance. The estimation of burn severity is critical for managing the care of the patient. However, these estimates depend on the assessor's training and judgment with burn specialist reporting 70-80% accuracy and non-burn specialists a 50-60% accuracy. A reliable standard for the accurate assessments of burn severity is needed.

Purpose:

The purpose of our study was to combine multispectral imaging (MSI) with machine learning algorithms for the rapid assessment of adult burn injuries.

Methods/Design:

In a multi-center IRB-approved study, an MSI device was used to image subjects 18 years and older with thermal burn injuries. The imaging device captured a set of images measuring the reflectance of visible and near-IR light within a 23 cm by 23 cm field-of-view. Images were collected from one to four burned regions of subjects with thermal burns up to 50 % TBSA. Subjects were enrolled and imaged within 72 hours and then serially imaged until 7 days post injury. The images collected were used to develop a type of machine learning algorithm called a convolutional neural network (CNN) that could automatically identify the regions of non-healing burn within an image. Prior to algorithm development, the actual regions of non-healing burn within every MSI image were identified by a panel of three burn surgeons. To accurately identify these non-healing regions, the panel of surgeons were given access to one of two clinical reference standards: a) the 21-day healing assessments for burns allowed to heal spontaneously; or b) pathology reports detailing histologic changes from multiple punch biopsies taken prior to burn excision and grafting. From this data, an ensemble of eight separate CNN algorithms was used to automatically identify non-healing burn tissue. The ensemble comprised a set of CNNs that were variations on the U-Net, fully connected CNN, and SegNet architectures. Training and test accuracies of the ensemble CNN were calculated using cross-validation at the level of the subject.

Results/Findings:

One hundred (100) adults were enrolled and imaged. The population had a mean age 45.6 ± 16.7 ; mean TBSA 13.0 ± 9.3 ; and was 31% female. From these adults, 210 burn regions were serially imaged. The estimated performance result from the ensemble CNN for identification of non-healing burn regions was AUC of 0.96. Based on the ROC curve, an ideal threshold showed an accuracy of 92.0%, sensitivity 91.9%, and specificity 92.0%.

Conclusions/Implications:

Our study demonstrates a dramatic improvement in accuracy of burn wound severity assessment over traditional bedside exam. More accurate burn wound assessment could lead to avoiding unnecessary surgeries or delays in treatment or referral, reduced length of stay, and dramatic cost savings. Use of such a device in a disaster has additional value to better align resources with clinical needs.

Laser treatment for scar reduction may be more effective when used for scars less than six years old

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Introduction

Burn injury is the fourth most common type of trauma after road traffic accidents, falls and interpersonal intentional injury. It is associated with substantial morbidity and poor quality of life due to exuberant scarring. Hypertrophic scarring is a particular concern as up to 70% of burns patients develop these scars[1]. Laser therapy has been used to treat pathological scarring with variable positive clinical outcomes[2-4]. The time since wound healing may be a factor but this has not yet been determined.

Purpose of the study

In this study, we examined the impact of the length of time the scar had been established on efficacy of scar reduction using ablative fractional carbon dioxide laser therapy.

Method

This is an interim report of an intra-patient, single-blinded, randomised controlled longitudinal study, final recruitment target n=60. Participants (n=10) with hypertrophic scars from burn injury were recruited to Queen Elizabeth Hospital Birmingham (REC reference: 19/NS/0125) and completed 3 ablative fractional CO₂ laser treatments over a 12-month period. Based on scar age, these participants were categorised into two groups: young scar (< 6 years; n=5) or old scar (18-31 years; n=5). Combined scar assessments including Modified Vancouver Scar Scale (mVSS), DermaScan and DSMIII-Colorimeter were used to evaluate scar outcomes.

Results/Discussion

Our results showed the group with young scars had significant improvement in mVSS after laser treatments, compared to old scars (fold change, young scar: 0.96 ± 0.072 vs. old scar: 1.25 ± 0.081 ; $p=0.03$). DermaScan further revealed that the skin thickness in the young scar group was reduced significantly (fold change, young scar: 0.68 ± 0.06 vs. old scar: 1.21 ± 0.116 ; $p=0.0039$). Although not conclusive, the DSMIII-Colorimeter data indicated that scar age had minimum impact on laser treatment in reducing scar pigmentation and vascularity.

Conclusion

Our preliminary data suggest that treating scars early can significantly reduce scar thickness and improve overall mVSS scores and that this treatment in well-established scars may be less effective. These preliminary findings provide useful information in the optimum timing for treating scars using CO₂ laser therapy.

Experiences and reflections in establishing a new MDT advanced scar clinic and the initial findings

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Introduction

Occupational therapists and physiotherapists are key members of burns and plastics teams, often leading the follow up care of patients once healed. We found patients with problematic scarring referred from external clinicians to different Consultants in the hospital. Many of these patients required repeated steroid injections. Discussions with the therapists in the burns therapy interest group resulted in identifying only two services where therapists were involved in carrying out steroid injections. We established an additional MDT scar clinic with a therapist delivering steroid injections. A training programme, guideline and patient group directives (PGD) were developed.

Purpose of the study

To share our experience in advancing the practice of therapists, implementing the new clinic and to present some initial findings.

Methods

Data was collected retrospectively from clinic therapy documentation and analysed using descriptive statistics. Reflections of the journey in setting up the clinic were collected from the team members and results from a patient satisfaction survey examined.

Results/Discussion

Since the initiation of the clinic in 2019, 63 new patients were assessed with 55 requiring steroid injection. The total number of contacts were 88. Of the patients requiring steroid injection 34 identified as female and 21 male. The most common location of scarring was the ear (20), followed by the chest (12). With piercing (20) and surgery (9) being the most common cause of scarring.

The mean pre-treatment patient and observer scar assessment scale (POSAS) score was 6.4 for the patient and 5.1 for the observer. The mean post treatment score (the data available was for a range of 2-4 treatments with most patients not having a score for their complete series of injections) was 4.9 for the patient and 4.4 for the observer. There were only a small number of full data sets available for the POSAS scores (n=15).

To comply with our PGDs a proforma was developed to complete at each patient appointment. Initially there were limited number of appointments and patients required a series of treatment. A further trained therapist and the introduction of a therapy lead follow up clinic for repeated treatments has resulted in maintaining continuity for patients; increasing availability in Consultant clinics and increasing the opportunity for data to be more easily extracted via the clinic proforma.

The collaboration between clinicians and non-clinical staff has help drive this change. The balance of developing the therapist's skills and ensuring experience for trainees was a consideration in the clinic set-up. A lot of time and guidance from our pharmacy colleagues was required to write the PGDs.

Conclusion

To fully evaluate the service further data collection is required; however, the early results show a trend in good patient experience and outcomes. The experience of setting up this service will assist in its development to include other treatment modalities such as laser.

This service has led to improved patient access by reducing waiting times, professional development for therapy staff and consolidating patients in a service where they receive MDT care.

Enhancing Global Burn Care by Coeducating Practitioners from low and high-income countries via a synchronous online burns course based in the UK

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Introduction – As a consequence of and in part to the Covid -19 pandemic interaction on-line for meetings and education has become almost second nature to most of us. With this adoption of and developing competency with on-line technology has come the opportunity for global initiatives such as ours. We now have the opportunity to provide education across the globe and importantly for practitioners working in lower middle-income countries (LMIC) who may not have access to a programme of burn care education.

Purpose of the study –

The purpose is to understand the enablers and blockers to successful participation in a online burns module and importantly the benefits for all participants.

Methods – We undertook an initial pilot study to appraise the feasibility of on-line coeducation through enrolling a nurse from Laos a LMIC on to an online academic UK burns education program. We monitored the impact of this initiative on the virtual classroom environment, classroom activities, assessment tasks such as MCQ's. We used a survey to capture the experience of all participants.

Results / Discussion – Throughout the process the student and educators experienced some benefits and challenges.

Educational benefits

- LMIC student increased confidence in their professional practice, for example, reported improved understanding of burns injury and different management strategies of burn injury treatment.
- LMIC student increased understanding of different dressing types allowing use of donated dressings from the United State to be used in burn care.
- Increased connections facilitating access to expert advice for burn injury management plans leading to greater depth of educational learning.
- Introduction of new treatments to improve burn care i.e. burns first aid, use of local honey and papaya for wound management.
- Within the classroom LMIC student presence opened up a richer conversation to deeper meaning, leading to greater burns care management education and learning.

Educational challenges

- First student from Laos was within a Difference in time Zone – Use of the Educational platform opens learning material recordings to watch at different times. Student would watch some classes the next day and use of what's app group for any questions.
- Language barriers to some discussions requiring student to ask meaning
- Infrastructure with Wi-Fi and hardware meant LMIC student was not able to have camera on or use microphone so participation was sometime curtailed
- The LMIC students' academic qualification and professional training did not permit access to a UK university to study at either undergraduate or postgraduate level attendance on a Continuing professional development basis

Conclusion – Enabling access of a LMIC student to attend a UK burns academic module enabled greater discussion and learning within the student group, this led to deeper education content and exploration of the learning. Both educators, LMIC student and students on the module found the experience enjoyable to

learn together. Next steps are to continue the pilot with a surgical student from Sierra Leone in the next cohort which will be within the same time zone and evaluate the process.

Early experience of BTM in acute and reconstructive paediatric burns

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Introduction:

Dermal substitutes have been used in the state paediatric burns unit in Western Australia for acute and reconstructive burns since 1993. Integra was the most used template in these earlier days and a 10-year review in 2006 of 26 acute and reconstructive burns revealed 23% loss of template due to infection and 50% re-grafting rate in acute burns.

Since 2019 NovoSorb® Biodegradable Temporising Matrix (BTM) has been used exclusively as the dermal template for paediatric acute and reconstructive burns in our unit. We have reviewed the data so far to compare these early outcomes.

Methods:

A retrospective review was conducted of our electronic database; analysing all paediatric burn and complex wound patients treated with BTM at the state paediatric burns service between 2018 and 2022.

Results

- Eight patients in total had 9 wounds treated with BTM; 5 acute burns and 4 reconstructive burns/contracture wounds.
- Mean and median age of patients was 5 years (range 15 months–12 years)
- The mean percentage total body surface area (%TBSA) was 13%, and the median was 4.5% (range 1-55)
- Mean follow-up time was 15 months, the median was 14 months (range 3 - 36 months) and mean time to delamination of the BTM and skin grafting was 22 days, whilst median was 21 days (range 20-37 days)
- Four patients required treatment with antibiotics however no BTM was lost due to infection.
- Two of the 5 (40%) acute burns required re-grafting for early skin graft loss, whilst none (0%) of the reconstructive patients required re-grafting.

Discussion

BTM is a relatively new dermal substitute in the management of acute and reconstructive burns and complex wounds. Our early data suggests much less loss due to infection, supporting other work which shows BTM as being very resistant to loss by infection. The early re-grafting rate in our small series of patients appears similar to that in our Integra patients. It is too early to compare the matrices on scar quality; however, this data is being collected and we hope to investigate this as our follow-up period with BTM extends.

Conclusion

Analysis of early data collected suggests that there is much less loss of BTM due to infection in comparison to other dermal substitutes. Further research is required to determine scar quality outcomes and re-grafting rate.

Understanding the barriers and enablers for seeking psychological support following a burn-injury

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Objectives: Burn injuries can have a wide-ranging, long-term psychological, social, and physical impact on patients. In line with the Burns National Standards, the psychology team screen patients within 24 hours of referral when clinically appropriate. Upon discharge from the unit, patients and their families are informed that they can refer for psychological support at any point for burn-related psychological distress. However, data from one burns unit, found a low level of adult self-referrals to the burns psychology service. It is unclear how many, and why, patients who meet criteria for psychological support are not self-referring. The aim of this study was to gain an understanding of: 1) patients' awareness of psychological support offered by a burn's psychology service; 2) barriers to accessing this support; 3) patients' perception of what would be beneficial for them following discharge; and 4) whether patients identify any practical areas for improvement.

Methods: Semi-structured interviews were conducted with patients who have experienced a burn injury, to gather qualitative data regarding the barriers to accessing psychological therapy, the facilitators, and potential service improvements to encourage help-seeking. Thematic analysis was used to summarise the main themes from interviews.

Results: Interviews are currently taking place. Initial findings indicate practical, cultural, and social barriers to accessing support. Recommendations for service changes include providing information about therapy, the impact of burns, and providing access to information about other service users' experiences.

Discussion: This study reports qualitative findings of the barriers and facilitators to accessing appropriate psychological care following burn injury. It is hoped that this learning will continue to lead to improvements in burns multidisciplinary care and enhance the uptake and experience of psychological support for patients and their families.

Conclusion: Conducting semi-structured interviews with patients has provided an opportunity for the team to understand barriers to psychological care. Several recommendations for service improvement are made.

The changing face of a paediatric burns unit in times of NHS pressures – adapting to meet new challenges

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Background

The NHS is being challenged with increasing patient numbers and complexity, exacerbated by the COVID pandemic and the subsequent backlog of cases. With increased pressures on inpatient beds, there has been a drive to accommodate patients in different areas, and broaden the cases managed

Aims

To review the changing pattern of cases managed in a paediatric burns unit over the past 10 years, with a particular focus on non-burns activity

Methods

We reviewed the ward records for assessments, admissions and activity on the burns unit over the past 10 years. The numbers were then plotted on simple graphs to identify trends and changes over that period.

Results

There has been a fairly constant number of burns admissions over the period studied. There was a six-fold increase in burn assessments over the first 5 years, but that has now stabilised, and the overall burns activity has remained relatively constant since 2015. Telemedicine reviews were introduced during COVID, but although this facility remains, it has dropped to around 30% of the peak usage in early 2020. However, there has been a marked increase in non-burns activity, and this now comprises up to 45% of patient contacts. There are nearly equal numbers of plastic surgery and burns assessments, and a greater number of non-burns patients admitted, albeit generally for a shorter time. The majority of these are short surgical admissions (mostly day-case) under plastic surgery. There are also regular orthopaedic, maxillofacial and dental surgery admissions, as well as a busy plastic surgery dressing clinic.

Discussion

In challenging times, wards may be required to take on additional responsibilities, especially in times of acute bed pressure. This presents particular challenges to specialist areas, which may be asked to take general patients, or have staff moved to cover other areas in the hospital. Burns staff have specific skills in managing wounds and dressings, which can be directly applied to assessment and care of patients with plastic surgery and orthopaedic injuries or operations. There is also significant crossover with occupational and physiotherapy. As well as providing high quality care for patients, maintaining a high level of appropriate activity reduces the chance of staff being redeployed to general wards. It also reduces the likelihood of paediatric medical patients, who have very different needs, being managed on the burns unit. Clearly it is essential to retain capacity for burns patients, but proactive consideration of what other patients can be managed may both improve patient experience, and help retain staff skills.

Health Literacy in a scar treatment portal website: Can Personal and Public Involvement help in detecting the benefits and pitfalls?

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Introduction

Pathological Scarring (PS) as a result of burn injury remains a real concern and clinical challenge, causing physical, psychological and socio-economical burden. Over 100 million people worldwide suffer from PS. Many of these people search for solutions, but except from unvalidated internet sources, relevant information is lacking. To guide these people in their search we developed an informative website from an interprofessional point of view and with the perspective of Personal and Public Involvement (PPI). This website provides evidence based information on a wide variety of treatment options. Patients can perform a search for suitable treatments via scar characteristics or scar types. To be successful in this journey, we decided to involve patients in the development of this website.

Purpose of the study

The aim of our study is to investigate whether this website meets the relevant health literate criteria, increased the patients' knowledge of scar therapies and whether the caregiver is always aware of the patients' health care demand.

Method

Patients will complete a pre-use online/paper questionnaire to assess their awareness about possible therapeutic solutions to improve their scars. After visiting the website and performing the above mentioned search, patients will receive a post-use online/paper questionnaire to assess changes in information knowledge together with a health literacy patient survey and patient feedback form to evaluate the feasibility of the search and health literate language used. Patients and their respective caregivers will both perform the same search to investigate the differences in their outcome. Patients and caregivers will start the search from their respective points of view and the aim is to detect whether they end up with the same therapeutic solutions.

Results

The aim is to recruit 40 patients of different gender identities, age and digital literacy together with their caregivers. To date the results for 8 patients were recorded. These results indicate that the patients' knowledge of scar therapies increased with 42%. The majority of patients stated that they prefer to rely on their caregivers' expertise instead of critical thinking by informing themselves. Almost all caregivers were well aware of their patients' specific demands. To date 7 website pages were already adjusted to improve the health literate language used. At the BBA 2023 conference, we will present further preliminary results of this study.

Discussion/Conclusion

Previous research in other health domains reported that medical consultations were usually too short to elaborate a meaningful representation of a patients' health problem. When consulting an informative website with understandable content, on the contrary, people could take all the time they needed to navigate in the website and to confront their situation with the information provided. By providing them this modality, they could improve their self-comprehension which could set appropriate expectations and avoid misunderstandings to achieve realistic outcomes. Our study aims to confirm these findings in the domain of PS by listing the benefits and pitfalls of such an informative website and detect the factors influencing the patients motivation to make use of such a website.

10 year review of major burn patients presenting to a regional Burns Unit ($\geq 25\%$ TBSA for adults), 2013 to 2022.

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Introduction:- Our Burns Unit is part of the Midland Burn Operational Delivery Network (MBODN). As the only Burns Unit within this network, we accept and treat referrals outside of the National thresholds following local derogation agreement¹ (care of patients $\leq 50\%$ TBSA). Major Burn audit commenced 2013 onwards looking at patient outcomes for all patients $\geq 25\%$ TBSA presenting to our Burns Unit, including those subsequently transferred out to the regional Burns Centre.

Purpose of the study:- Collate 10 years of data looking at outcomes for this patient cohort.

Methods:- Retrospective review of patient medical records. Data proforma has evolved over the years², and now includes fluid resuscitation, weight loss, ED vs Burns TBSA assessment, inhalational injury, surgical episodes, MDT therapy outcomes and complications.

Results/Discussion:- Total of 66 patients across the period - 48 male (73%), 18 female (27%). Average TBSA for all patients was 46.5% (24% - 97%). There was an average difference of 3.7% TBSA estimate (ED vs Burns).

There were 32 survivors - average size of burn injury was 39.7% TBSA (25.5% - 80%). The average LOS (days) per %TBSA for survivors, was 1.60 (0.46 to 5.16).

ITU admissions 30 patients (total 289 days); HDU 4 patients (19 days). No unplanned re-admissions to critical care within 48hrs discharge³.

34 deaths; of these 23 were EOL care/unsurvivable (68%). 38 patients (58%) had inhalational injury, of which 25 died (66%) - 23 of these were EOL (92%).

34 patients underwent initial excision of burn, majority going on day 2 (1 – 5). 50% of patients had complete excision/surgery by day 6. Average number of operations was 2.7 per patient. Since 2020 4 patients had Nexobrid® debridement only.

Review of PE/DVT complications – 2 patients.

From 2015, data collected for fluid resuscitation (1st & 2nd 24 hours post-injury). 33 sets recorded for 1st 24 hours, average of 4.21 mls/kg/%TBSA (2.5 – 11.18); 2nd 24 hours (26 sets) average 2.76 mls/kg/%TBSA (0.5 – 9).

From 2017, urine output data collected (1st & 2nd 24 hours post-injury). 23 sets for 1st 24 hrs showed average of 1.03 mls/kg/hr (0.26 – 3.9); 17 sets for 2nd 24hrs showed average of 0.85 mls/kg/hr (0.06 – 1.6).

MDT therapy outcome measures³ audited from 2017 (42 patients). 100% screened by physiotherapy, occupational therapy & dietician within 72hrs of admission. Pts requiring enteral feed started within 48hrs, 98% weight loss <10kgs at discharge. Psychology screening (2019) – 100% of applicable patients.

Conclusion:- Numbers of Major Burn Injuries are declining in western countries. This causes some concern regarding the need (and ability) to maintain levels of expertise and capacity. We feel it is important for services to maintain resilience and ensure an ability to provide burn care for major injuries when centre-level care is not available. We consider this audit demonstrates our service can provide good quality care for major burn injuries, up to our admission threshold, and that a degree of dispersal in burn care across a region can be safely maintained over a 10 year period.

Extract of *Tamarindus indica* seeds: towards alternative strategies to combat antimicrobial resistance in infected burn wounds. 78 Dr. HY Lam Hospital Universiti Sains Malaysia/department Of Reconstructive Science Unit

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Introduction. The antimicrobial properties of tamarind seeds, leaves, and fruit extract are attributed to phenolics and terpenoids. To the best of our knowledge, no literature has reported the antimicrobial properties of tamarind seed extract against those multidrug-resistant traits. Therefore, this study focuses on the multidrug-resistant bacteria frequently encountered in infected surgical and burn wounds in hospitals.

Objectives. This paper discussed the potential use of tamarind seed as a new antibiotic substance or topical antimicrobial agent to treat the infected surgical wound or burn wound. The present study aims to determine the antimicrobial properties of the natural plant, especially in the rise of multiple drug-resistant strains of microorganisms in the infected surgical wound.

Methods. The phytochemical compounds of tamarind seeds were extracted using solvents with various polarities (hexane, methanol, and ethyl acetate). Hexane, methanol, and ethyl acetate with different concentrations were used to examine the sensitivity toward gram-positive and gram-negative microorganisms. Agar well diffusion method was used to determine the antimicrobial activities and minimum inhibitory concentrations (MIC) of different plant extracts against Gram-positive bacteria (*Staphylococcus aureus*, Methicillin-resistant *Staphylococcus aureus* (MRSA), *Streptococcus pyogenes*), Gram-negative bacteria (*Pseudomonas* spp., Multidrug-resistant *Pseudomonas* spp., *Escherichia coli*, Extended spectrum β -lactamase producing Enterobacteriaceae (ESBLs), Carbapenem-resistant Enterobacteriaceae (CRE), *Acinetobacter baumannii*, Multidrug-resistant *Acinetobacter*),
Results. The phytochemical studies of the extract revealed that ethyl acetate extraction contained the highest number of fatty acids compounds that have antioxidant properties. The result of tamarind seeds extracts with ethyl acetate showed the highest inhibition of bacteria used in the study except for *Escherichia coli*, Extended spectrum β -lactamase producing Enterobacteriaceae (ESBLs), Carbapenem-resistant Enterobacteriaceae (CRE). The average zone of inhibition for ethyl acetate extract of tamarind seeds ranged from 8-33 mm. The minimum inhibitory concentrations (MIC) ranged from 12.5 mg/ml for ethyl acetate and 3.12 mg/ml for methanol; the minimal bactericidal concentration (MBC) was 12.5 mg/ml for ethyl acetate and 3.12 mg/ml for methanol. The hexane extract of tamarind seeds did not show significant antibacterial activity compared to the ethanol and hexane extract.

Conclusions. The future use of tamarind seed extract as a new antibiotic substance is beneficial for antibiotic-resistant strains and effective against many microorganisms. In addition, the tamarind seed extract works well for treating common pathogens in infected surgical wounds and possesses antioxidant compounds that promote wound healing.

Dan's Fund For Burns Befriender Peer Support Service: A befriender / befriender experience

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Introduction

Many burn survivors face challenges, both physical and mental, integrating back into everyday life. Some need regular support and can struggle emotionally, even years after sustaining a burn injury. Dan's Fund For Burns (DFFB) identified the need to improve availability of post hospital emotional support. In January 2022, DFFB launched a national befriender peer support service for adult burn survivors.

Purpose of the study

The DFFB Befriender Peer Support Service addresses the gap in support availability and provides a unique opportunity for trained burn survivors to be 'matched' to individuals seeking one-to-one peer support.

Method

This befriender support service uses a customised database to 'match' benders and befriendees based on criteria such as gender, age, type/location of burn, ethnicity and more. The criteria is ranked in order of importance by the individual (befriender) seeking support. Once the match is made, DFFB contacts the individuals and the peer support meetings can begin using Zoom, MS Teams or a phone. The initial commitment is to meet once a week for 4-6 weeks. DFFB facilitate the initial meeting and provide ongoing support.

'Befrienders' are trained adult burn survivors who offer voluntary one-to-one peer support to other burn survivors who may be struggling emotionally and/or physically at any stage of their recovery. They feel ready to support others by sharing their own lived experience of burns. These individuals are recommended by burn service professionals and undergo training from DFFB and St. Andrew's Centre for Burns Psychological Therapies Service, Broomfield Hospital. The training covers boundaries, confidentiality, disclosure, safeguarding, communication skills and managing risk.

'Befriendees' are adult burn survivors who feel they would benefit from the support and guidance of an individual who has a shared lived experience of a burn. They can contact DFFB directly to access the Befriender Peer Support Service. They would complete an application form that includes ranking criteria for 'matching'.

Results and Discussion

Since launching, the DFFB Befriender Peer Support Service has made six matches: three are ongoing, one is on hold for medical reasons and two started but later changed their mind. Feedback from our ongoing matches suggest befriendees have benefitted from being able to speak to someone who has 'been there' and 'gets it' and the peer support has helped them 'turn a corner' in their recovery. The benders feel good about 'giving back' and 'making a difference'. You will hear first hand from one of our befriender/befriender matches.

Conclusion

Regular peer support can make a difference in the emotional recovery from burns. There are currently 15 trained befrienders on the database with a plan to train approximately 15 more. By having more trained burn survivors on the database with different types of burns, different ages, genders etc., and offering this one-to-one support as an online service, we aim to more closely match befrienders with befriendees without the need for geographic proximity.

Self-harm Burn Injuries at Stoke Mandeville Hospital Burns Unit - a 10-year review 2012-2022

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Introduction:

Self-harm burns are becoming increasingly common. NICE guidelines state that patients whose injuries are a result of self-harm should be treated the same as those whose injuries are not self-inflicted and that each episode of care should be treated independently. The aim of the present study was to explore the frequency of self-harm burn injuries in a UK burns unit, the demographic characteristics of individuals presenting with self-harm injuries, the burn injury characteristics, and treatment outcomes.

Methods:

Retrospective review of self-harm burn cases between March 2012 – Feb 2022 at Stoke Mandeville Hospital Burns Unit. Cases were identified through IBID and all electronic hospital records were analyzed.

Results:

180 cases of self-harm burns were recorded over the 10-year period. Females were three times more likely to present with self-harm-related burns injuries than males and 5% of presentations were in children under 16. The median %TBSA of these burns was 1%. Nearly 7% of the self-harm injuries were reported as suicide attempts and 20% of patients seen with self-harm burn injuries were current psychiatric inpatients. Most patients sustained injuries that could be managed in outpatient clinics with one-third of patients requiring surgical intervention. Of those requiring admission, 30% were discharged within 24 hours. The data indicate that 41% of patients returned to the unit with further self-harm burn injuries.

Discussion:

This study summarises the data regarding self-harm burn injuries over a 10-year period. There are limitations to this study, as there are often DNAs, patients lost to follow-up, and underestimation of cases due to the inconsistent data input onto the IBID platform in the early years of this data collection. The key learning points are:

Suicide and self-harm risk assessment on initial consultation is essential, this could be included in a burns assessment proforma,

It is important to manage the burn in a timely manner and ensure patients have appropriate community mental health follow-up and support, to help prevent further self-harm.

MDT involvement during the acute episode is essential to give patients the best chance of favorable short and long-term outcomes.

Conclusion:

This study presents data regarding self-harm injuries in a UK burns unit. Findings highlight the importance of thorough risk assessment and facilitating community psychiatric follow-up to help minimize further injury, alongside providing appropriate evidence-based burns care.

Under the surface: Clinical considerations for scar thickness measurement using ultrasound based on a scoping review

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Introduction: Hypertrophic scarring affects between 40 and 90 percent of people following traumatic cutaneous injury, which are caused by burns or penetration of the skin by a sharp object. Ultrasound shows promise as a non-invasive imaging method for measuring the thickness of hypertrophic scars that could be used routinely in scar clinics, research, clinical decision making, and providing feedback to patients.

Monitoring the scar response to treatment and tailoring the depth of penetration of laser scar treatments are examples of potential applications.

Despite the advantages of ultrasound measurement of scar thickness, varied and poorly reported methods (e.g., transducer and subject orientation, measurement site relocation, and measurement of unscarred skin for comparison) and a lack of understanding of scar characteristics being measured (e.g., fibrosis, oedema, hair follicles) limit the conclusions that can be drawn from existing research.

Purpose of the study: To map the ultrasound methods used to measure traumatic scar thickness, gain a better understanding of what scar characteristics are being captured by these measurements, and outline clinical considerations for health professionals.

Methods: A standardised search of electronic databases was conducted in Ovid MEDLINE, Embase, Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Web of Science of the concepts "ultrasound", "skin", "thickness", and "measure". Grey literature searches were conducted in Google. Databases were searched from inception to present (date last searched 08/09/2021). Records included were those where B-mode, high-frequency, or ultra-high frequency ultrasound was used to measure the thickness of traumatic scars.

Results/Discussion: Searches identified 9309 records, of which 118 records (n = 82 journal articles; n = 36 abstracts) were included for data extraction. A total of 5213 participants were measured, with B-mode or high-frequency (i.e., >20MHz) B-mode ultrasound being the most common type of ultrasound used (n = 72; 61%). Where reported, measurement of the combined epidermal and dermal thickness was the most common approach (n = 28; 24%). Other methodological considerations (e.g., scar relocation and measurement of unscarred skin) were varied and underreported. Oedema was most commonly reported as being measured in the epidermis (n = 11; 9%), while fibrosis (n = 40; 34%) and hair follicle presence and density (n = 1; 1%) were most commonly reported as measured in the dermis.

Conclusion: The heterogeneity and lack of appropriate reporting of ultrasound measurement methods hinder between-study comparison, and replication of findings in different contexts and at the same scar site longitudinally over time. Additionally, greater understanding of skin characteristics that should be measured for different treatments may assist in treatment planning, and monitoring and interpreting the treatment response. Recommendations for methodological standardisation are presented based on the findings of this research.

The feasibility of Negative Pressure Wound Therapy versus Standard Dressings in Paediatric Hand and Foot Burns: A Pilot, Single-Centre, Randomised Control Trial

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Introduction: The goal of paediatric hand and foot burn management is hypertrophic scar and/or contracture prevention. The risk of scar formation may be minimised by integrating Negative Pressure Wound Therapy (NPWT) as an acute care adjunct as it decreases the time to re-epithelialisation. NPWT has known associated therapeutic burden; however, this burden is hypothesised to be outweighed by an increased likelihood of hypertrophic scar prevention. This study assessed the feasibility, acceptability and safety of NPWT in paediatric hand and foot burns with secondary outcomes of time to re-epithelialisation, pain, itch, cost and scar formation.

Methods and analysis: This was a single site, pilot randomised control trial. Participants were ≤16-years, otherwise well and managed within 24hours of sustaining either a hand or foot burn. Thirty participants were randomised to either standard care (Mepitel® – a silicone wound interface contact dressing – and ACTICOAT™ – a nanocrystalline silver-impregnated dressing) or standard care plus NPWT. Patients were reviewed until three months post burn wound re-epithelialisation, with measurements taken at dressing changes to assess primary and secondary outcomes. Surveys, randomisation and data storage were done via online platforms and physical data storage collated at the Centre for Children's Health Research, Brisbane, Australia. Analysis was performed using Stata statistical software.

Results: This study has just finished data collection and preliminary analysis has begun. Results will be available at the time of the conference.

Ethics and Dissemination: Queensland Health and Griffith University Human Research ethics approval including a site-specific assessment was obtained. The findings of this study will be disseminated through clinical meetings, conference presentations and peer reviewed journals.

Registration and Details: Registered with the Australian and New Zealand Clinical Trials Registry (ACTRN12622000044729, <https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=381890&isReview=true>, registered 17/01/2022).

Developing Online Support for People Affected by Burn Injuries

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Introduction

Barriers to accessing psychosocial support, such as geographical and time restraints, present challenges for people who may already be experiencing difficulties managing the consequences of their burn injury. For this reason, it is necessary that other avenues of psychosocial support are explored. Accessing health information online has become a popular avenue of gaining information and advice in relation to personal health concerns. Online support can promote shared experience and alleviate feelings of isolation, as well as promoting health autonomy and more effective illness-management. However, due to the complex nature of burn injuries and the interplay between physical and psychosocial health, generalised online support may not address the specific needs and challenges faced by people affected by burn injuries. It is for this reason that there must be more online resources available for the burns community which are specific to the experience of sustaining a burn. Healthtalk is an award-winning website offering easy access to other people's experiences of a wide range of health conditions but, until now, it has not included a designated section specific to burn injuries.

Purpose of the study

To explore the lived experience of people affected by burn injuries and use the data to create a burn-specific web resource on Healthtalk.org.

Methods

A qualitative approach using semi-structured interviews with questions about their experiences of having a burn, or parenting a child with a burn. Due to COVID restrictions, interviews were conducted either online over Microsoft Teams or over the telephone. 36 interviews were completed with people affected by burns (11 people burnt as an adult, 13 people burnt as a child, and 12 parents of children with burns). Interviews were transcribed verbatim and the data was coded using Braun and Clarke's six steps of thematic analysis. The OSOP (one sheet of paper) method of analysis was then conducted and broad themes were identified.

Results/Discussion

In all, 23 topic summaries were created under 5 broader headings: burn circumstances, treatment and services, living with a burn, adjusting to life with a burn, and information and support. Comprehensive write-ups of each topic summary were completed which aimed to reflect the shared experience of those interviewed; these were accompanied by the corresponding interview clips, which will be displayed on the Healthtalk website.

Conclusion

The interview data demonstrated that although the experience of having a burn is unique to the individual and there are nuances of treatment and impact, there is still an underlying shared experience between those with a burn. The creation of a burn injuries Healthtalk module aims to reflect these shared experiences to provide people with a sense of peer support in the form of a freely available online intervention. It can also be used as a training resource for health professionals.

Measurement of Platelet Thrombus formation in Severe Thermal Injury

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Introduction

Severe thermal injury significantly impacts upon haemostasis and is associated with changes in platelet count with a nadir at day 3 post-injury with a rebound thrombocytosis at day 15. Reduced platelet counts encompassing the nadir and rebound have also been associated with poorer outcomes, including sepsis and mortality (Marck et al, 2013, Cato et al, 2018). Limited studies have assessed platelet function in thermal injury as platelet tests often require large quantities of blood, are not representative of normal platelet pathophysiology and are usually dependent on platelet number.

Purpose of the Study

The purpose was to confirm the classical changes in the platelet count following burn injury and to measure platelet physiological thrombus formation in vitro using the Total Thrombus-formation Analyser System (T-TAS, Zacros, Fujimori Kogyo Co. Ltd., Tokyo, Japan) which is a whole blood flow chip-based system for the measurement of in vitro thrombus formation under variable shear stress conditions.

Methods

Adult (≥ 16 years) patients ($N = 9$) with $\geq 20\%$ total burn surface area (TBSA) were recruited within 24 hours of injury to the West Midlands Regional Burns Centre, Queen Elizabeth Hospital Birmingham. Healthy controls ($n = 25$) were also recruited. Blood was withdrawn from each participant via antecubital venepuncture using a sterile 21-gauge needle into tri-sodium citrate anticoagulant BD vacutainers (9:1 vol/vol). Platelet counts were generated using the XN-1000 whole blood counter (Sysmex UK). Platelet function was measured using the T-TAS. Twenty microliters of CaCTI reagent (Corn-derived trypsin inhibitor and Calcium) was added to 480 μ l of whole blood prior to testing. Blood was then tested within 2 types of chips coated with tissue thromboplastin and collagen at a shear stress of either 600 /sec (AR chips) or 1200 /sec shear stress (HD chips) the latter test being independent of the platelet count. Occlusion Time (OT) and Area Under the Curve (AUC) were recorded.

Results/Discussion

We confirmed the classical nadir in platelet counts following severe thermal injury at days 2 ($p < 0.0005$), 3 ($p < 0.0005$), 4 ($p < 0.0005$) and 5 ($p < 0.005$) post-injury compared to healthy controls to set up a normal range. Physiological platelet thrombus formation was abnormal post injury in 22% of patients using the AR chips but was related to the platelet count ($p < 0.05$). However, platelet dysfunction was also apparent in 22% of patients using HD chips but was independent of platelet count ($p = 0.3$) demonstrating that there can be an acquired platelet functional abnormality. Furthermore, the AR chip AUC was significantly lower at day 1 post-injury and associated with severity of injury (TBSA, $p < 0.05$) and survival ($p < 0.05$).

Conclusion

Post injury physiological platelet thrombus formation can be abnormal in severe burns but is related to the fall in platelet count within the TTAS-AR chip. However, using the higher shear TTAS-HD chip, abnormal platelet dysfunction can also be detected independently of the platelet count in some patients. This study suggests that measuring platelet dysfunction within a more physiological in vitro test may have potential clinical utility. Larger studies are required to fully understand the impact of platelet dysfunction in severe burn injury.

The rehabilitation continuum: Early vocational burns therapy in both the inpatient and outpatient settings

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Introduction

Burn injury results in changes to health with both physical and psychosocial effects that affect the patient's ability to return to work. Burns rehabilitation starts from the point of injury and is enabled by a multidisciplinary approach. It can be a complex journey for the patient to navigate. Barriers along this journey include physical impairment, compliance, participation restrictions & environmental factors. Literature shows that nearly 28% of all burns survivors never return to any form of employment (Mason et al, 2012). With improved interdepartmental working since Covid, therapists in the burns unit at Salisbury NHS Foundation Trust explore how in-reach and outreach therapy can both support the patient's rehabilitation journey and promote their return to vocational activities.

Purpose

To understand how effective links are built between both inpatient and outpatient specialist rehabilitation services. It is thought that this focus on vocational reintegration may improve the patient's rehabilitation journey and support their return to vocation.

Method

A retrospective look at the journey of two patients through rehabilitation services at Salisbury NHS Foundation Trust will be explored. The paper will demonstrate how we aim to provide a seamless transition between inpatient and outpatient services through our in-reach vocational rehabilitation and our outreach specialist burns therapy.

Discussion/ Conclusion:

The pathway set-up at Salisbury allows referral to the vocational rehabilitation centre during the inpatient stay. In-reach therapy services are provided in the acute phase of inpatient care. This is followed by provision of outreach burns therapy in the vocational rehabilitation centre during the outpatient phase. Links built between the burns unit and the same site vocational rehabilitation centre allow a continuous pathway of care between inpatient and outpatient services. This has been shown to improve the care experience and overall outcome for the patient. These improvements in the rehabilitation program help to allow a timely return to vocational activities within months of the burn injury.

The Effect of Obesity in Acute Outcomes of Resuscitation Level Burns Injuries

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Significant burn injuries pose a multitude of problems for the burns team that can be complicated by patient body habitus. Obesity has implications for patients' functional status, co-morbidities, immunology, surgical risk, ventilation and routine care in the intensive and ward setting. There is limited literature on the implications of obesity on the burnt patient, and current literature does not differentiate between small and large burns. We therefore sought to examine the relationship between obesity and mortality, length of stay in ITU and in hospital, and number of visits to theatre.

Data was obtained from 224 patients over 5 years (November 2017 – October 2022). 7 patients were underweight, 67 overweight, 56 obese and 13 morbidly obese. Patients were controlled for age, TBSA, full thickness TBSA, and co-morbidities including frailty. The overweight patient group had a significantly lower mortality than the other patient groups (25.4% overweight vs 38.3% normal weight). There was no difference between normal weight patients and the obese or morbidly obese groups (38.3% normal weight vs 39.1% obese and morbidly obese) There was no statistically significant difference between groups for total length of stay, length of stay in ITU, or number of trips to theatre. Average weight loss over ITU admission period was 2.5kg. (82.8kg on admission vs. 80.3kg on discharge), with an average weight loss of 6.4kg for patients admitted longer than 30 days over the same time period.

In summary, it is an important finding that outcomes of obese patients are not significantly different in the acute phase, and this has implications for planning patient care in large burns. The observed reduced mortality in the overweight population group may be attributable to a physiological reserve able to accommodate weight loss in the catabolic phase of burn recovery. The fact that no change in mortality was conferred to obese patients suggests a distinct pathology and population that warrants further investigation.

Exploring the role of Computer-Assisted Decision-Support Tools in burn management: A rapid review

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Background- The biopsychosocial impact coupled with its need for intricate care, make burn management and recovery complex. Computer-assisted decision-making tools (CADTs) are used in different clinical scenarios, yet its role in burn management seems limited. Burns are a challenging global public health issue (particularly in low-middle-income countries), and especially in terms of chronic pain. Complexity and severity of symptoms, and its multidimensional impact on patient quality of life (as well as those important to them) warrants palliative and end-of-life care interventions.

Purpose of Study- This review outlines current uses of CADTs in burn management, with the aim to identify gaps for further research and to inform holistic public health interventions such as palliative care and rehabilitation.

Methods- The review followed the PRISMA flow-diagram. Studies were extracted from PubMed using the following keywords:

(Decision Making, Computer-Assisted) AND ((Burn Units) OR (ICU) OR (Intensive Care Unit) OR (dermatology) OR (emergency medicine)) AND (Burns)

Retrieved records were screened based on their titles, abstracts, and full text access and analysis. The Hawker Critical Appraisal tool was used for quality assessment.

Results- 13 papers were included in the review. The majority (54%) discussed new software design, highlighting the novelty of the field. However, most studies gave fewer specifics regarding average participant age, burn severity, gender, and ethnicity. Using the Hawker Critical Appraisal Tool, the range of scores in the review varied from 21 to 36, with the average being 30/36, suggesting scope to improve future research quality.

Conclusion- Burns are a public health issue and would benefit from palliative care interventions, given the biopsychosocial impact it has on patients and those important to them. Further investigation of this impact on diverse populations (e.g., different age groups, burn severity, and ethnicity) is critical in translating CADTs into clinical practice.

Self-Inflicted Versus Accidental Burn Injuries: A Systematic Review of Characteristics and Outcomes

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Objectives

Due to their peculiar characteristics, self-inflicted burn injuries constitute a significant burden to affected patients, their families and the healthcare system compared to accidental burns. They occur worldwide with varying incidence amongst cultures, regions, social and individual health backgrounds. However, irrespective of location and personal circumstances, these injuries are preventable. This review aims to highlight the characteristics and outcome of this patient population in comparison to accidental burn injuries from available literature. The available evidence will help identify possible instigating factors and mechanisms to mitigate these injuries.

Methods

A comprehensive literature search was performed using Medline and Embase databases. Variations of the terms “self-inflicted”, “suicide” and “burns” were combined in a search strategy, with MeSH and Emtree terms. Titles were screened in parallel by independent investigators. Strict predefined eligibility criteria were employed to identify studies comparing the characteristics and/or outcomes of self-inflicted burns with accidental burns patients. Qualitative analyses and risk of bias assessments were undertaken for each included study.

Results

The literature search returned 3241 hits. Following removal of duplicates, title/abstract and full text screening was conducted with 26 studies identified for inclusion in this review.

All studies compared the characteristics of patients with self-inflicted burns to those with accidental burns; 17 studies also assessed the outcomes. Studies were retrospective and covered most continents, with the exception of Africa. Relative to accidental burns, self-inflicted burn cohorts were predominantly female, younger and unemployed with pre-existing psychiatric disorders. Marital and/or family problems were frequently cited triggers for the incident and recreational drug and alcohol abuse was also more common in this group. With regards to intentional burns, flames were the most common source of injury and they were more likely to be severe in nature (as quantified by the percentage total body surface area affected). In hospital length of stay and mortality were also significantly greater, relative to the accidental burns population.

Conclusions

Intentional self-inflicted burns are common in certain cultures as a means of protest and among people with impulsive behavior. Development of best practices for prevention, treatment, rehabilitation and social support is necessary. Targeted and community-based prevention strategies would be worthwhile. Increased awareness of these injuries and the complications of burns should be in the spotlight.

Investigation of an outbreak of Panton–Valentine leucocidin positive methicillin resistant *Staphylococcus aureus* in the National Burns Unit using whole genome sequencing.

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Introduction

Panton–Valentine leucocidin (PVL)-positive methicillin resistant *Staphylococcus aureus* (MRSA) is associated with significant morbidity and mortality. PVL is a binary exotoxin, encoded by lukF-PV and lukS-PV, that forms pores in leukocyte membranes which can present with skin and soft tissue infections (predominantly abscesses), but can also cause invasive infections such as severe necrotising pneumonia. Recovery of this organism is of particular concern in a burns unit, given that these patients are vulnerable to serious infection from the loss of normal skin integrity and the frequent need for invasive treatment.

Purpose of the study

To describe the investigation and resolution of an outbreak of PVL-positive MRSA in a National Burns Unit using a range of methods including patient and staff screening, environmental sampling and whole genome sequencing.

Methods

The National Burns Unit is a 14 bed ward which comprises of a mix of single rooms and one multi-bedded bay along with a dedicated theatre located adjacent to the unit. Following the recovery of a cluster of PVL-positive MRSA isolates an outbreak was declared, the unit closed to new admissions and an investigation was initiated. This included a retrospective review of MRSA positive cases in the unit, extensive environmental screening, an environmental audit and screening of 80 staff members and WGS investigation of the isolates.

Results

Between October and December 2022, MRSA was recovered from eight patients who were either colonised or infected. Epidemiological typing assigned this strain to spa type t311 and clonal complex (CC)5. The isolates were also found to harbour the PVL genes. Core genome MLST (cgMLST) found that these strains all had ≤2 allelic differences from each other. Extensive environmental sampling detected the outbreak strain in one patient room that was linked to the first known positive case. Among staff screened, two were found to be colonised with MRSA, one with the outbreak strain and the other with an unrelated PVL-negative strain of MRSA. Both of these staff members were offered decolonisation. Once all known positive patients had been discharged, the burns unit and the dedicated burns theatre underwent deep cleaning and repeated environmental sampling did not detect any further positive samples. At this point, the unit was reopened with a plan for close monitoring to ensure no recurrence.

Conclusion

We describe an outbreak of PVL positive-MRSA in our National Burns Unit involving patients, staff and the environment. The use of WGS was essential for rapid, real time outbreak investigation. The outbreak was controlled using a variety of infection prevention and control methods. The strain was assigned to t311 and CC5 had not previously been recognised in the Burns Unit or elsewhere in the hospital and so its origin could not be determined. Elsewhere this strain has been associated with outbreaks in Latin America including Argentina and Chile.

A comparative study between negative pressure wound therapy and with conventional dressings in burn management with skin graft to assess wound healing and outcomes; A prospective comparative study.

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Introduction-

Burn victims after primary resuscitation, correction of dehydration, infection control, and nutrition care, often needs removal of dead skin, followed by skin grafting, being immunosuppressed, infection prone and pain sensitive, needs proper postoperative care, a dressing is needed, which should be able to protect the wound from external contaminants, managing wound exudates, prevent wound damage, minimum patient discomfort/pain, ease of dressing change and lesser frequency of dressing change.

Purpose-

The study aimed to compare the frequency of dressing change, ease of dressing application, pain score, length of hospital stays, induction of rehabilitation of burn victims who underwent tangential excision with homograft/autograft application.

Methods-

We have included 30 patients including 15 receiving NPWT and 15 having conventional gauge dressing of burn injury who underwent tangential excision/debridement with homograft or autograft with NPWT and the conventional dressing respectively. Patient included were TBSA of burn > 10% irrespective of age, sex, mode of burn and wound type. Patient excluded were infants, pregnant females, burn >50% of TBSA and admissions after 48 hours, standard burn care given, dressings were changed 3-5 days after first application in both the groups and accordingly data were collected on parameter including, frequency of dressing change, ease of dressing application, pain score, length of hospital stay and initiation of rehabilitation.

Data were analyzed using SPSS (Statistical Package for Social Sciences) 21.0 version, IBM, Chicago. Data were analyzed for probability distribution and it found to be normally distributed. Thus, parametric test of significance was applied. Inter-group comparison of continuous variables was done using Independent 't' test. Inter-group comparison of pain score (VAS scale) was done using Man-whitney U test. Inter-group comparison of categorical variables was done using Chi-square test. P value <.05 was considered statistically significant.

Results-

Group I- Negative pressure wound therapy

Group II- conventional dressing

The mean TBSA of group I and II patients was 30.5 ± 8.331 and 32.2 ± 8.971 respectively. The difference between the TBSA of group I and II patients was statistically non-significant (p value- .588).

Majority of the patients were not having any comorbid condition. There was no significant difference between the groups based on presence of comorbidities (p value- .739).

The frequency of dressing was significantly more in group II compared to group I (p value- .001).

The mean duration of hospital stay was significantly more for patients belonging to group II (conventional dressing) compared to group I patients (Negative pressure wound therapy) [24.8 ± 6.449 vs 19.0 ± 3.722 days] (p value- .046).

The pain score reported by group II patients was significantly more compared to that reported by group I patients [4.0 (3.0-5.0) vs 6.0 (5.0-7.0)]

Conclusion- NPWT cause decrease in pain, ease of nursing care, more patient discomfort and less duration of hospital stays , lessens the wound closure time, hence early rehabilitation and mobility. However, the potential of benefit of NPWT depends upon proper application on the challenging areas from NPWT application

The carbon footprint of burn care - strategies to assess and mitigate

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Introduction:

A person or institutions' "carbon footprint" is the sum of all greenhouse gases resulting from their activity, released into the atmosphere. The impact on the environment related to all human activity is increasingly important, and healthcare activity must also be taken into consideration. Only if the carbon footprint of healthcare activity can be identified is it possible to intervene to mitigate environmental impact – in this case related to burn care.

Purpose of study:

We set out to determine the carbon footprint of burn care and come up with solutions aimed at abating this

Methods:

- 1) We undertook a literature review to:
 - a. estimate the carbon footprint of burn care from in-patient care, out-patient care, outreach activity and surgical care domains
 - b. estimate the carbon footprint in other areas of healthcare and what interventions had been undertaken to reduce this
- 2) We undertook an environmental and procedural overview to identify aspects of burn care that contributed most to the carbon footprint and explored interventions to assist in reduction

Results:

Our literature review found that hospitals and surgical clinics are the second most common contributor of waste in the United Kingdom. It is estimated that in 2018, the combined surgical field produced more than 6600tons of waste/ day. Burns is a speciality that requires a lot of personal protective equipment (PPE) to prevent cross-infection, and regular wound care and dressings, leading to high output of waste. It is estimated that Burns and Plastic surgery departments are responsible for almost 40% of all surgical waste. Theatre waste accounts for approximately 75% of all health service waste. Current practices of waste disposal including use of incineration and waste landfills and practices around sterilisation of re-useable material (autoclaves, Gamma radiation, chemical disinfectants) pose a serious threat to the environment.

Our environmental and procedural overview to identify aspects that contributed most to the carbon footprint of burn care include:

- 1) Long travel for appointments for patients in remote areas generates a significant carbon footprint. Our regional burn centre caters for a population of over 6 million people including those in distant remote areas
- 2) Packaging and disposables especially dressings and PPE
- 3) Running of water taps for prolonged periods to reduce bacterial colonisation in hospital water system
- 4) Over subscription to instrument provision
- 5) Disposable theatre gowns and hats

We found a number of ideas through which the carbon footprint in burn care could be reduced by translating from other areas of healthcare, including:

- 1) Increased alcohol gel disinfection of hands to reduce water consumption
- 2) Low-energy light bulbs
- 3) Reduction of instrument provision
- 4) Use of reusable theatre gowns and hats
- 5) Increasing telemedicine and using absorbable sutures to reduce return appointments

Conclusion:

There is limited literature on the carbon footprint of burn care. No previous work was found relating to assessing or mitigating the carbon footprint in burn care. We have started the ball rolling to both identify and mitigate this important issue as the basis for future – hopefully collaborative work.

Does early wound coverage provide an independent survival advantage over and above burn excision itself in major burns? Results from the largest international dataset on major adult burns.

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Introduction:

Burns remain a serious public health concern globally. Early burn excision (EBE) has replaced conservative approaches as the standard of care in most burn centres globally, deemed to have a survival advantage. What has not been clinically proven is whether survival advantage comes from the excision, the wound coverage (and type) or both. The importance of 'early' wound cover following EBE, using autograft or other products on patient outcomes remains to be determined.

Purpose of study:

- (1) to determine whether there is any survival advantage to covering major burns within 7-days post-burn following EBE, compared with simply excising the burn and delaying cover until after 7-days post-burn
- (2) to determine whether the type of cover applied (temporary or autograft) is important in conferring survival advantage.

Methods:

The RE-ENERGIZE¹ dataset was analysed. Timing of each surgical procedure performed following admission and type of burn cover used, burn severity measures, and patient demographics were collated. We used 7-days as the cut-off to define 'early burn excision'. Primary outcome was 3-month mortality. Logistic regression analyses were performed to identify factors predicting outcome. We also compared temporary wound cover versus autograft.

Results:

Following removal of patients lost to follow-up or who withdrew consent, a total of 1116 patients were included in the study. Median age was 50 years (Inter-quartile range [IQR] 34-64). Median TBSA% was 29 (IQR 20.3-41), median BAUX was 82 (68-95), while median APACHE II score on admission was 13 (IQR 8-20). Three-month mortality overall was 15.41% (n=172). Median time to excision and temporary covering (xenograft, allograft or skin substitutes) (ET) was 4 days (IQR 3-6), while median time to excision and autograft (EA) was 7 days (IQR 3-12). A total of 68 patients underwent early excision (within 7 days), with burn cover delayed beyond 7 days (EO), while 584 patients underwent ET or EA within 7 days. Following confirmation of significant predictors of mortality upon univariate logistic regression, multivariate logistic regression adjusting for age, BAUX, Charlson Comorbidity Index and APACHE II, revealed that EO patients had a significantly increased risk of mortality ($p=0.004$, Odds ratio [OR] 2.51, 95% Confidence Interval [95% CI] 1.34-4.71), meaning that covering the burn within 7-days post injury improves the chances of survival. When comparing type of cover applied (ET versus EA) within 7 days, there was a significant survival advantage for EA ($p=0.0105$ OR=0.43, CI=0.23-0.77). However, when adjusting for TBSA, the survival advantage became insignificant ($p=0.163$, OR=0.63, CI=0.33-1.21). This indicates that for very large TBSA burns, the patient has a high risk of mortality that does not appear to be affected by types of frequently used wound cover, so long as cover is provided.

Conclusions:

In this large patient cohort, we show that for EBE, simply excising a major burn in the absence of wound cover (of any type) is associated with higher risk of 3-month mortality, than providing wound cover within 7 days post-burn. Furthermore, for those with extensive burns, the type of wound covering applied (temporary or autograft) within 7 days is inconsequential.

Integrating consumer Virtual Reality systems into the burn centre: overcoming obstacles in hospital integration of non-proprietary systems for patient benefit

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Introduction:

The use of virtual reality (VR) in the medical field is growing in popularity due to its potential benefits in reducing pain and anxiety, improving engagement and motivation during rehabilitation, and helping patients cope with loneliness in the hospital. This study aims to identify solutions to the challenges of introducing VR into the hospital setting, specifically focusing on infection control and procurement of hardware and software.

Purpose of Study:

To find solutions to the following challenges of introducing VR into the hospital environment:

- 1) Identification of infection control procedures and suitable accessories for decontamination and prevention of cross-infection
- 2) Establishment of a system for setting up patient accounts and paying for software
- 3) Identification of the most suitable software for patients to use in various scenarios

Methods:

Our approach was as follows:

- 1) Literature review
- 2) MDT approach to identify suitable equipment, software, and accessories
- 3) Consultation with lead microbiologist to develop decontamination procedures
- 4) Use of research funds to obtain hardware and software
- 5) Collaboration with NHS Trust IT department to set up a generic patient account
- 6) Development of bespoke decontamination protocol with the help of a biocide specialist and microbiology testing
- 7) Step-wise protocol for introduction of VR into clinical practice

Results:

We:

- 1) Obtained a prepaid cash card to buy hardware and software, avoiding lengthy procurement processes
- 2) Set up a generic patient account and connected the VR device to the Trust intranet
- 3) Developed a robust decontamination protocol and implemented accessories such as washable silicone insets and disposable single-use face shields and headphone covers
- 4) Implemented a process of staff familiarization and selected a library of VR software for a range of scenarios
- 5) Confirmed the effectiveness of the decontamination protocol through microbiological testing

Discussion:

The results show that consumer VR products can be successfully implemented in a hospital setting with proper considerations and problem-solving. The benefits of VR in burn care can be fully realized when

implemented thoughtfully and safely. The vast array of applications opened up by this study could be a game-changer in the hospital environment, as demonstrated in the burn care setting.

Conclusion:

The study demonstrates how consumer VR products can be introduced into a hospital setting with some modifications. The use of VR in burn care has the potential to bring significant benefits to patients and healthcare providers, but it must be done with caution and careful planning to ensure patient safety and success.

Intraoperative 3D bioprinting after skin injury to promote regenerative repair

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Background

3D bioprinting provides an unprecedented opportunity for accurate, reproducible delivery of complex biomaterials and cell mixtures to drive tissue regeneration. Largely 3D bioprinting to date involves pre-printing of a structure/mimic prior to implantation. However there is scope for the intraoperative use of 3D printing, in particular for the replacement of skin during surgery for burn trauma.

Methods

We have been testing both extrusion and drop-on-demand 3D bioprinters to deliver cell and bioink combinations in vivo using a porcine preclinical model of full-thickness excisional injury. Multiple full-thickness injuries were generated on individual animals and these were then treated with both the positive control and a range of 3D bioprinted treatments. A set of modified base inks were used to assess the impact of the addition of biological components that may promote faster wound closure or collagen deposition. Analysis of wounds over time included using flow cytometry, histology, photography and immune profiling. Healing of 3D bioprinting treated wounds was compared to ReCell/INTEGRA treated wounds as a clinical comparator.

Results

3D bioprinted cells and matrices appear stable and persist in the treated wounds for a minimum of 2 weeks. In the acute phase after treatment no significant increase in inflammation or immune responses to the use of matrices was observed. The addition of biological components to the base inks appears to promote improved healing and outcome when compared to those without biological components.

Conclusions

These data suggest that 3D bioprinting presents promise for the future of skin injury and disease treatment. The combination of improving technology in conjunction with more accurate molecular and cellular characterisation will provide significant advances in the future treatment of burn injury, as increasingly specific cell subsets promoting regeneration and advanced matrices and delivery devices drive improved scar outcomes.

The impact of LOX inhibition on extracellular matrix production and its potential for the treatment of scar

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BACKGROUND: Lysyl oxidases are a family of enzymes that play a critical role in scar formation, maintenance and fibrosis. Lysyl oxidases stabilize the main component of scar and fibrotic tissue, collagen, through cross-linking. This cross-linking renders the collagen less soluble and less susceptible to degradation, leading to increased stiffness of tissue in scar and fibrosis. We have developed a new irreversible inhibitor of all Lysyl oxidases, PXS-6302. In this study we have assessed the potential for PXS-6302 to ameliorate scarring and fibrosis.

METHODS: Using in vitro cell assays to assess collagen production as well as murine and porcine models of excisional and burn injury, we have investigated the effect of PXS-6302 treatment on scar formation. In addition we investigated the effects of PXS-6302 on fibrosis using a murine bleomycin model. Finally, we have conducted initial phase I studies of PXS-6302 to assess safety, target engagement and potential for the treatment of scarring and fibrosis.

RESULTS: PXS-6302 readily penetrates the skin when applied as a cream and abolishes lysyl oxidase activity. In murine models of injury, topical application reduced both collagen deposition and cross-linking of collagen. Topical application of PXS-6302 after injury also significantly improved scar appearance without reducing tissue strength in porcine injury models. Initial phase I studies demonstrated lysyl oxidase inhibition in skin and negligible systemic absorption. Preliminary data suggests changes in the extracellular matrix and associated proteins consistent with scar improvement in participants with established scars.

CONCLUSION: This study demonstrates that targeting lysyl oxidases may present an effective approach in the treatment of scar. Final analysis of an RCT in established scars, as well as a study into the impact of LOX inhibition in the healing phase after burn injury, are ongoing.

Reflections on 5 years of experience with BTM reconstruction.

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Our National Burn Centre provides care for adult and paediatric burn injured patients. BTM first became available to us in 2018, and over the past 5 years we have increased our experience with this template predominantly in the acute but also in the elective setting.

Approximately 250 reconstructive cases using BTM have been performed. We discuss our technique for optimising outcomes when using this product. We discuss decision making in relation to managing collections, haematomas and appearances concerning for non-integration.

Limitations of the product in our experience are described, including less predictable integration on certain defects and anatomical locations. Total length of stay is increased with use in smaller TBSA burns, however we have found that ICU length of stay is reduced in comparison to our previous model of care.

Advantages reported with BTM include improved quality of reconstruction and predictability of graft take on less favourable wound beds. Furthermore, the presence of wound infection is usually tolerated by BTM and integration proceeds. We have also found increased flexibility when scheduling cases reconstructed with BTM during phases when our centre has been over our surgical capacity, and this conferred a significant advantage when we were faced with a burn mass casualty event.

We reflect upon the impact of this product on our model of care over the past 5 years.

Burn lessons learned from the Whakaari White Island volcanic eruption

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New Zealand's most active volcano, Whakaari White Island was a common tourist attraction prior to its eruption on 9th December 2019. At the time of the eruption, there were 47 people on the island from three tour groups. 39 people survived the initial eruption and were extracted. 31 entered into the New Zealand National Burn Service across four hospitals.

The median age of the patients treated at the National Burn Centre was 45.5 years (range: 14 – 67 years) and median total body surface area burn was 49.5% (range: 9% - 90%). The three-month survival of this eruptive event was 55%, which subsequently fell to an overall rate of 53% following one late death of an early survivor after repatriation home. Of the patients who survived the initial eruption for long enough to be admitted to the National Burn Service, the overall survival rate was 71% at three months.

We describe the lessons we have learned from our management of the survivors.

NEXOBRID APPLICATION AS A DAY CASE PROCEDURE: A SINGLE UNIT EXPERIENCE BEFORE AND DURING COVID-19 PANDEMIC

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Introduction

Bromelin-based enzymatic debridement (Nexobrid™) has been used routinely in management of burns and diabetic foot ulcers. Majority of the previous studies have reported that patients had an average inpatient stay of 38 days in hospitals with this treatment.

Purpose of study

Our study is aimed to compare the suitability of use of Nexobrid™ in day case treatment of burns before and during the COVID-19 pandemic.

Methods

Between 2016 and 2022 (pre and during COVID-19), patients who sustained burns requiring enzymatic debridement were recorded into our unit's database. For this study, the database was retrospectively assessed to identify patients who were treated as a daycase procedure. We further collected their age, co-morbidities, percentage of burns, area of burns, types of anaesthesia and subsequent treatment including autograft or allograft. Immediate post procedure complications and pain scores were also recorded. The data was analysed using Microsoft Excel®.

Results

The total number of patients who had Nexobrid™ treatment as a daycase procedure was 10 patients prior to the pandemic (2016-2019). However, during the pandemic (2020-2022), there was a significant increase of patients that had this treatment within our unit (total number = 45 patients). It was mainly for burns of mixed depth (>75%) from scalding. The mean age of these patients were comparable at 39.2 (range: 17.0 – 68.9) before pandemic and 42.4 (range: 22-80) during the pandemic. Before the pandemic, these patients sustained burns ranging from 0.1% to 2.0% of total body surface area (TBSA) (mean TBSA: 0.82%) and the burns were confined to both upper and lower limbs. However, during the pandemic we treated patients with more than 2% TBSA, and most of them went on to have allograft on the same day post Nexobrid™. No significant immediate post op complications were recorded and the maximum pain score 15 mins post application of Nexobrid™ was 3 (with a maximum pain score of 5 after 2 hours post application which was easily controlled with analgesia).

Conclusion

Managing burns patients during the COVID-19 pandemic brought many of its own challenges. Our study has shown the increasing role of treatments such as Nexobrid™ in debriding burn wounds effectively and quickly as a day-case. This further also enabled immediate allograft placement with minimal discomfort or post-op complications. Its treatment usage particularly in such day-case setting is believed to have reduced the risk of COVID-19 exposures for patients, unnecessary hospital admissions which may have had an

impact especially on the hospital costs and burden during the pandemic. Furthermore, efficient management of burns could positively impact patient's psychological wellbeing.

Outcomes and complications in the diabetic burns patient – experience from The National Burns Unit in Ireland

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Introduction:

Burns cause acute stress-induced hyperglycaemia, which is known to increase mortality and morbidity. With the rising prevalence of diabetes and the advent of newer hypoglycemics, the true effect of pre-existing diabetes in patients with burns remains to be fully elucidated. Understanding this relationship is essential in managing this complex cohort and improving patient outcomes.

Objective:

This study aimed to establish the effect of diabetes mellitus on length of hospital stay (LOS), in-hospital mortality and infectious complications, including healthcare-acquired pneumonia (HAP), urinary tract infection (UTI), skin infection (SSTI) and sepsis in patients admitted with burns. The incidence of serious cardiac, respiratory and renal complications during hospitalisation was also evaluated.

Methods:

One thousand (n=1000) patients admitted to the National Burns Unit in Ireland between 2012 and 2022 were included in this retrospective study. Patients and outcomes were identified from the HIPE (Hospital In-patient Enquiry) data system, in which data from patient medical records are coded by trained coders. Institutional ethical approval was granted.

Results:

Of 330 patients included in an initial interim analysis, 206 (62.4%) were male and 124 (37.6%) were female; mean age was 48.9 years (CI: 46.7-51.1). Twenty-three patients (6.9%) had pre-existing diabetes. Patients with pre-existing diabetes had a longer LOS compared to non-diabetic patients (26.5 days (CI:9.3-43.6) vs 16.2 days (CI: 13.3-19.1), p=0.04). They were also more likely to develop serious cardiac complications while hospitalised (3 (13.1%) vs 10 (3.2%), p=0.001). However, there were no differences between diabetic and non-diabetic patients in terms of in-hospital mortality (2 (8.7%) vs 12 (3.9%) p=0.272), HAP (4 (17.4%) vs 25 (8.1%) p=0.310), UTI (3 (13.1) vs 16 (5.2%) p=0.120), SSTI (5 (21.7%) vs 45 (14.6%) p=0.361) and sepsis (1 (4.3%) vs 13 (4.2%) p=0.982).

Conclusions:

Burns patients with diabetes had a significantly longer hospitalisation and suffered increased cardiac complications. However, they did not have increased hospital acquired infections or mortality. The present study supports the current literature which suggests that diabetes is an important risk factor in determining the prognostic outcome of burns injuries. This data is being used to support a change of practice and the implementation of new guidelines in managing diabetic burns patients in our unit.

Validation of FLIR-ONE thermal imaging against Laser doppler imaging using burns treated with enzymatic debridement

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Introduction

Clinical assessment of burn depth is accurate in only 60 to 75% of cases, even when carried out by an experienced burns surgeon.[1] Laser doppler imaging (LDI) is the current gold standard adjunct for assessing burn healing potential, and has been shown to reliably determine microvascular perfusion following enzymatic debridement.[2] FLIR-ONE devices assess burn depth using infrared technology, with deeper burns appearing cooler due to reduced blood flow and loss of cellular metabolism. When compared to LDI, FLIR-ONE cameras are handheld, lightweight, and may be attached to smartphones - thereby making them user-friendly and relatively inexpensive.[3] Enzymatic debridement can be utilised for validation of FLIR-ONE and LDI techniques as tools for the assessment of burn depth and healing potential.

Purpose of the study

Our study aimed to assess whether FLIR-ONE thermal imaging correlates with LDI in accurately predicting burn depth, as validated by bromelain-based enzymatic debridement.

Methods

We assessed all patients presenting to a UK burns unit with mixed depth burns suitable for enzymatic debridement between October 2022 to present. A standardised protocol for LDI, FLIR ONE, and clinical photography within 48-72 hours of injury was implemented. Warmest and coolest points of a burn wound on thermal imaging were recorded, in conjunction with temperature differences between burnt and unburnt skin. This was correlated with LDI healing predictions, and clinical burn depth assessment. Nexobrid™ debridement took place shortly after imaging. Clinical photography was repeated post-debridement, with clinical review and documentation of predicted healing potential by an experienced burns consultant and specialist burns care nurse.

Results/Discussion

In this 4 month study period, 5 patients met criteria for inclusion in the study. Average TBSA of the burn was 6.4%. Mechanism of burn injury was a mixture of scald and flame burns. LDI correlated with FLIR in all cases. FLIR was accurate in predicting deep and superficial areas, and quantifying the effects of enzymatic debridement in all cases.

Conclusion

Early results from our study suggest thermal imaging using FLIR-ONE to provide a reliable assessment of burns depth, as correlated with clinical findings pre- and post-enzymatic debridement. Its benefits over LDI is that it is user-friendly and relatively inexpensive. Data collection is on-going with the aim of developing a multi-centre protocol for establishing FLIR-ONE as a clinical adjunct to burns depth assessment.

Defining the “elderly” population in the treatment of major burn injuries: A dataset of over 1000 patients from 54 burn centres, worldwide.

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Introduction: Management of major burns remains a medical and surgical challenge. Elderly patients are some of the most vulnerable to burn injuries, and their management is even more challenging. The lethal dose burn size leading to 50% mortality (LD50) in the elderly is 30-35% TBSA, and this has remained unchanged over recent decades. Much of the literature refers to the ‘elderly’ as a distinct sub-group of adults, when considering best management practices. Generally, ‘elderly’ is accepted as ≥ 65 years of age. Although the Baux score has shown the correlation between advanced age plus burn TBSA and mortality, the significance of advancing age as an independent predictor of outcomes in major burns is not clearly defined.

Purpose of the study: (1) to determine the independent predictive value of age for major burn outcome; (2) to define a sub-population of ‘elderly’ patients, with significantly higher risk of poor outcome, whom should be managed as a distinct sub-group of adult burns.

Methods: We utilised the RE-ENERGIZE^a clinical trial dataset (the largest international dataset on major burn patients). Primary outcome was 3-month mortality. Length of ICU stay was a secondary outcome. Logistic and linear regression analyses were performed to identify factors predicting outcomes.

Results: A total of 1116 patients were included in the study, 74% of whom were male. Median age was 50 (Inter-quartile range [IQR] 34-64) years. Median TBSA% was 29 (IQR 20.3-41), median BAUX was 82 (IQR 68-95), while median APACHE II on admission was 13 (IQR 8-20). Fifty eight percent of patients received invasive mechanical ventilation (IMV), while 11.8% received continuous veno-venous haemofiltration (CVVH). Three-month mortality overall was 15.41% (n=172). Median age of those patients who died was 60.5 years (IQR 49-71.25). Median age of the survivors was 48 (IQR 33-62). Following confirmation of significant predictors upon univariate logistic regression, multivariate analysis revealed that age was a strong predictor of 3-month mortality ($p=0.000$, OR=1.07, CI=1.06-1.09), independently of TBSA%, APACHE II and requirement for organ support (IMV or CCVH), meaning for every incremental increase in age, there is a 7% increase in the risk of death. Patients ≥ 65 years (n=264) are over 7 times more likely to have died at 3-months post-burn, than those patients < 65 years ($p=0.000$, OR=7.44, CI=4.6-11.83). Importantly, stratifying the data revealed that patients 65-74 years (n=167) had a significantly greater risk of 3-month mortality ($p=0.000$, OR=2.44, CI=1.50-3.98), while patients aged 60-69 (n=195) did not ($p=0.091$, OR=1.49, CI=0.94-2.36), implying that it is the patients in the upper 50th percentile of this age group that are at increased risk of mortality. Linear regression suggested that being age 65-74 could statistically predict length of ICU stay ($F(6, 897)=101.07$, $p=0.025$, R squared= 0.40, Adjusted R-squared=0.399).

Conclusion: In this large patient cohort, we show that despite advances in modern-day burn care, advanced age remains an important predictor for mortality. Patients ≥ 65 years have a significantly poorer outcome, irrespective of the injury severity and resultant critical illness severity, and as such require specialized burn care to enhance the chances of survival after burn injury.

Implementation of Negative Pressure for Acute Paediatric Burns (INPREP): Barriers, Enablers and Implementation Strategies for a Stepped Wedge Randomised Trial

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Background

Paediatric burn injuries pose a major epidemiological challenge worldwide and can result in significant morbidity. Early application of negative pressure wound therapy (NPWT) has been shown to significantly improve the time to re-epithelialisation in paediatric burn patients. This adjunctive treatment has not been broadly or routinely adopted.

Methods

Phase 1: The Consolidated Framework for Implementation Research (CFIR) was used to inform the co-design and evaluation of the INPREP Pathway and to understand barriers and facilitators to implementation. We conducted surveys (n=80) and interviews (n=20) across four of Australia's largest paediatric burn centres. Implementation strategies were selected from the Expert Recommendations for Implementing Change (ERIC) and a consensus focus group. Identified CFIR barriers were matched to implementation strategies using the CFIR-ERIC matching tool as well as the ERIC implementation strategies. The final INPREP Pathway, including clinical decision-making and accompanying implementation strategies, was decided at a consensus group meeting. Some of the key strategies include developing a formal implementation blueprint, identifying and preparing clinical champions, developing/conducting/distributing education materials, promoting adaptability, involving consumers and family members, obtain and using family feedback throughout the implementation phase.

Phase 2: We will conduct a multi-centre, prospective, pragmatic, stepped-wedge cluster randomised controlled trial to implement the INPREP pathway for acute paediatric burn injuries. Participants include acute paediatric burn patients presenting to four Australian tertiary paediatric hospitals for burn treatment. Using a hybrid type III design, this study aims to evaluate the effectiveness of the INPREP Pathway implementation using (i) implementation outcomes (e.g., adherence, feasibility, sustainability) and (ii) clinical outcomes (e.g., days to re-epithelialisation, scar requirements, skin grafting requirements). The primary outcome of this trial is INPREP Pathway adherence – the rate of eligible patients who received the NPWT. Due to the nature of the intervention, participants and healthcare professionals administering the intervention cannot be blinded in this trial. Therefore, researchers and the biostatistician analysing the data assessing outcomes in this trial will be masked.

Discussion

This investigation will result in the development of a variety of implementation strategies, training materials and clinical resources that can be shared widely to facilitate the implementation of NPWT for acute paediatric burns in a hospital setting, co-designed by clinicians, consumers and patients. We anticipate that the co-designed INPREP Pathway will be generalisable to emergency departments and burn centres across Australia, and the evidence generated will inform paediatric burn care internationally.

Trial Registration

This trial was prospectively registered with the Australian and New Zealand Clinical Trials Registry (ANZCTR) on the 1st of February 2022 – registration number ACTRN12622000166774.

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Recovery of Functional Independence following Major Burn Injury: a Systematic Review

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Introduction: Major burn injury, despite advancements in preventing consequent mortality, can have a profound impact on long-term morbidity, affecting quality of life as well as effecting a significant associated socioeconomic burden. Fundamental milestones of recovery include regaining independence in self-care, mobility, unsupported living, and meaningful activities.

Purpose of Study: This review aimed to explore factors predicting recovery of independence, the expected rate and time in majorly burned patients, and the measures of progress in rehabilitation used.

Method: A systematic search of four databases (MEDLINE, EMBASE, COCHRANE, CINAHL) was conducted for studies with Level 4 evidence or greater (excluding other systematic reviews/meta-analyses) reporting outcomes pertaining to physical ability indicative of independent function in adult (>16y) cohorts who had suffered a major burn (>15% TBSA) up to 30 years post-treatment in a developed specialised burn service. Data extracted included factors affecting, rate of, and time to achievement of function in five independence domains, as well as the outcome measures utilised.

Results: Twenty-one eligible studies were included, comprising 1298 major burns survivors with a combined mean age of 39.6y and a mean TBSA of 25.8%, and ranging from assessment following stepdown from ICU to 27 years postburn. The most significant recurring factors impacting recovery of independent function were older age, female gender, burn severity, prolonged ICU and hospital admission, preceding mental health conditions, and post-acute psychological issues. Exercise-based rehabilitation conferred benefits on major burn patients even several years post-injury. Discharge to independent living from hospital occurred in 27% to 97% of patients, while return to work rate reports varied from 52% to 80%. Burns Specific Health Scale-Brief, Functional Independence Measure, and Physical Composite Score (SF-36) were the most widely used outcome scoring systems.

Conclusion: Major burn survivors have protracted recovery with potential for persistent chronic impairments, remaining consistently below baseline levels of function. Non-modifiable factors such as age and gender, and disease characteristics such as burn size with associated physical, physiological and psychosocial sequelae are contributory. Further research is required to explore achievement of specific milestones of major burn and polytrauma critical care patients, while early targeted rehabilitation addressing physical, psychological and vocational needs has promising potential benefit.

denovoSkin® dermo-epidermal skin substitute for paediatric burn wound reconstruction

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Introduction

The management of large paediatric burns continues to present a challenge to reconstructive surgeons. The current standard treatment, split-thickness skin grafting, is fraught with donor-site limitations and unsatisfactory long-term outcomes. Particularly in the context of a growing child, the prospect of reconstruction with a bioengineered full-thickness skin substitute is appealing.

Purpose of the study

We report the case of a 10 year old boy who sustained a 50% total burn surface area (TBSA) flame burn and inhalational injury as result of a house fire. Due to limited availability of autologous donor sites, compassionate-use of a novel, laboratory-grown, dermo-epidermal skin substitute (denovoSkin®, Cutiss, Zurich, Switzerland) was sought. The process and outcome of this novel method of reconstruction of full-thickness defects were reviewed.

Methods

The patient was admitted to the Irish national paediatric burns centre on the day of injury. Wounds were debrided and closed with NovoSorb® Biodegradable Temporising Matrix (BTM, PolyNovo Biomaterials Pty Ltd, Melbourne) in two stages on day 0 and day 2 following the injury. On day 11, a thin split-thickness skin biopsy measuring 4cm² was harvested and transported to Zurich for manufacturing of denovoSkin® as per manufacturer protocol. The bioengineered denovoSkin® grafts were received in four weekly batches, from day 40 post injury. Grafts were secured with ARTISS (Baxter, Deerfield, IL USA) and staples and dressed with Mepilex Ag. Remaining wounds were resurfaced with meshed autologous split skin graft as donor sites became available, with complete wound closure achieved at day 62.

Results/Discussion

Having stabilised the debrided burn wounds with BTM, the patient remained systemically stable throughout the reconstructive process. The denovoSkin® was easy to handle and showed excellent engraftment in all anatomical sites including thigh, arm, forearm, and torso. Some early loss of the keratinocyte layer occurred in the upper torso and shoulders/proximal arms due to localised pseudomonas infection at the tracheostomy site. At 12 month follow-up, the denovoSkin® was remarkably closer in feel, texture and quality to native skin than the adjacent mature meshed autograft.

Conclusion

This case highlights denovoSkin® as an ideal reconstructive option for large burn wounds in children. Our positive experience mirrors earlier favourable results in a small number of compassionate-use cases. Phase II clinical trial results of this novel skin substitute are eagerly awaited.

The prevalence and outcomes of toxin producing staphylococcus aureus in paediatric burn wounds

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Introduction: Toxic Shock Syndrome is a rare but potentially fatal complication of any size burn. The most common pathogen is a toxic shock syndrome toxin 1 (TSST-1) producing staphylococcus aureus (SA). Rates of colonisation with toxin producing bacteria and the role of prophylactic antibiotics in paediatric populations are unclear.

Purpose of the study: To establish rates of paediatric burn wound colonisation with TSST-1 producing SA and to investigate clinical outcomes in our population where antibiotic prophylaxis is not routine.

Methods: A prospectively maintained burns database was retrospectively reviewed to identify all paediatric patients (aged 0 - 16 years) treated in the Scottish national burns centre as inpatients or outpatients over a 3 year period. All swab results were included. Wound cultures yielding SA bacteria are automatically sent for enrichment broth culture and a latex agglutination assay to assess if actively producing toxic shock syndrome toxin 1 (TSST-1). Clinical notes were used to determine outcomes of patients testing positive for TSST-1.

Results / Discussion: 1313 children were reviewed with 1365 swab results. 893 children (65%) had no growth on their swabs. SA was the most common positive swab result – 293 swabs (21%) - of which 4 were MRSA and 12 (0.8%) were shown to be actively producing TSST-1 toxin. Of these 12 children, 3 had become unwell requiring admission for IV antibiotics and monitoring. No patients required anti-toxin therapy (immunoglobulins or Fresh Frozen Plasma) or critical care support. The remainder were clinically well and managed as outpatients with oral antibiotics alone.

Conclusion: The prevalence of TSST-1 producing SA in paediatric burn wounds is low. With proactive testing for toxin producing species alongside sound wound care and parent and clinician education about toxic shock syndrome we have had no admissions to critical care environments with confirmed toxic shock. This would support against using routine antibiotic prophylaxis in paediatric populations to prevent toxic shock syndrome in similar settings.

Measuring change in burn injury scar tissue following a 10-week course of Lymphatouch (LT). A descriptive study.

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Introduction

Lymphatouch is a negative pressure, (NPT) treatment modality used by Burn therapists across the UK and Ireland to improve such things as the pliability and elasticity of scar tissue, reduce patient reported hypersensitivity and discomfort, reduce scar adhesions, and improve joint range of movement limited by adherent scar tissue.

Scar assessment is essential post burn treatment to measure changes to scar tissue including itch, pain, elasticity, colour, appearance, and mobility.

Purpose

The purpose of this paper is to measure change in scar tissue treated with Lymphatouch, using the St James's Hospital (SJH) screening assessment tool which includes both subjective and objectives assessments such as photography, Patient and Observer Scale Scar Assessment Scale (POSAS) , Cutometer®MPA 580 , Tewameter® and Mexameter®.

Methods

- Ten patients with an area of adherent partial thickness or full thickness burn injury of less than 10% TBSA were selected for treatment with LT.
- Inclusion and exclusion criteria were applied to patient selection, including time post burn injury of less than two years , ability to travel weekly to St James's Hospital, TBSA of burn injury and absence of any infection or unhealed areas.
- All patients were assessed pre and post treatment using the SJH screening assessment tool.
- A therapist was assigned to patient assessment and another to patient treatment.
- All patients completed a patient satisfaction survey at the completion of treatment.

Results

Seven out of ten patients completed 10 sessions of LT treatment.

Data analysis is currently being completed, however preliminary analysis of the findings indicates that the cutometer is an objective measure which was sensitive to change following a course of treatment with LT. The data needs to be further examined for correlation with the POSAS , Tewameter® and Mexameter® . Full findings will be presented at the conference.

Burning questions answered: A review of blood stream infections in Burns patients

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Introduction and aim:

Blood stream infections (BSIs) in burn patients require judicious and appropriate antimicrobial treatment. This study aims to review the epidemiology of BSIs in an Irish Burns unit, reviewing causative pathogens, relationship to infection in other body sites and resistance of pathogens, to guide treatment regimens to improve patient outcomes.

Methods:

A retrospective observational study of BSIs in an adult Burns Unit from 2017 to 2022 was performed. Data including demographic variables, burn types, organisms recovered and antimicrobial susceptibility profiles from patient samples were collected. Demographic variables included age, gender and mortality during admission were recorded. Burns variables were recorded by total body surface area (TBSA) and burn type. BSIs were classified by pathogen, likely source and clinical significance.

Results/Discussion:

176 pathogens from 145 positive blood cultures were recovered from 46 burns patients during the study period (158 bacteria and 18 yeasts). The mean age was 53 years with 56.5% male representation. The most common mechanism of injury was due to accelerant fires (26.1%) and house fires (19.6%), with scalds and gas explosions accounting for 13% each. The mean TBSA recorded was 28% (range 0.5%-90%) with 10 patients having inhalational injuries and 42 patients (91.3%) requiring intensive care unit (ICU) admission care. Six (13%) of patients died during the selected admission.

The average number of days from admission onset of the first positive blood culture was 12.9 days. The most commonly recovered bacterial species was *Staphylococcus epidermidis* (17%) with coagulase negative staphylococci (CoNS) responsible for 77 (43.8%) of all organisms. After CoNS, the most commonly recovered bacteria were *Staphylococcus aureus* (10.2%), *Escherichia coli* (8.5%), *Enterococcus faecium* (8.5%) and *Pseudomonas aeruginosa* (5.7%). The same organism was recovered from another source within 7 days in (73/46.2%) of bacteraemia (Figure 3), 62.7% were deemed to be clinically significant. The most common fungal organism isolated was *Candida albicans* (6.8%), followed by *C. glabrata* (2.8%) and *C. parapsilosis* (0.6%). All candidaemias were clinically significant and 94% of candidaemias had the same organism isolated from a non-blood source within +/- 7 days of the date of positive blood culture (Figure 1).

A review of antimicrobial resistance within burns patients was performed. Of note, 26 (56.5%) patients had resistant organisms isolated during the admission selected; Vancomycin Resistant Enterococci (VRE) (13;50%), Methicillin Resistant *S. aureus* (MRSA) (11;42.3%), Carbapenemase Resistant Enterobacterales (CRE) (4;15.4%), Multi-Drug Resistant *P.* (MDR-P) (3;11.5%) and Extended spectrum beta-lactamase (ESBL) producing Enterobacterales (2;7.7%). Of these 24 (92.3%) patients acquired the resistant organism(s) during their admission in the Burns unit/ICU, in 1 case being detected within 3 days of admission. On review of blood culture isolates, 12 (6.8%) of the 176 isolates were resistant; 4 MRSA, 1 ESBL, 5 VRE and 2 MDR-P.

Conclusion:

This study clarifies the epidemiology and significance of positive blood cultures within the Burns unit, allowing for refinement of antimicrobial regimens. However, given the significant proportion of patients with resistant organisms (56.5%), it remains necessary to tailor antimicrobial treatment to the individual's microbiome.

Bearing witness: Celebrating the journeys of burns survivors and their families

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Introduction

Burns clubs have been running within the UK since 1995, therefore several individuals who experienced their burn injury as a child have been part of a club for many of their formative years. An event was organised to recognise and celebrate the journey that continues for these young people long after the injury takes place. Narrative ideas around definitional ceremonies were incorporated in the development of a psychological workshop within a family residential weekend.

Purpose

This was the first event of this kind, so we wanted to conduct a thorough evaluation to both consider its future utility and to make use of feedback to further develop and improve the concept. Families were also incredibly generous with sharing their experiences and agreeing to be recorded so their experience could be analysed and shared with other individuals, families and professionals.

Method

Family weekends have long been established as part of burns clubs as there is widespread understanding and recognition of the impact that a burn injury has on the entire family. This was the first time trialling this specific kind of weekend, which included a workshop for the entire family alongside a small number of volunteers who had been part of the burns survivor's journey through club. The entire workshop ceremony was recorded and transcribed with the content undergoing a thematic analysis to identify the shared experiences of burns survivors. Attendees also completed a feedback form about their experience of the weekend.

Results/Discussion

Five families attended the event, with compositions ranging from a single parent and child to two parents and five children. The burns survivors ranged in age from fourteen to eighteen. The families that were invited had all been members of a burns club for several years and had attended a range of club activities including psychological workshops for both parents and young people. We had twenty-eight feedback forms returned and everyone rated the weekend as 'very good' and all stated they had fun. All twenty-eight respondents gained something from the weekend, with twenty-seven rating this as 'a lot'. Additionally, all felt their families and other attendees had gained 'a lot'. All respondents also stated they would recommend the workshop weekend to other families in the same position. Themes from the workshop included strength gained from being part of a community, connection with unexpected people, the difficulty of remembering and sharing as a family, the creation of safety and the recognition of strength and growth.

Conclusion

The weekend was very successful with positive feedback from the families and volunteers, suggesting a need for similar events in future. Careful consideration about which families to invite is needed as it was an incredibly emotive experience and may be overwhelming for families earlier in their journey. Another application of the format of the weekend could be to celebrate the end of the journey as a camper for seventeen-year-old leavers at burns camps. In addition, the themes identified can be shared as part of journals and conferences to help other families and professionals.

The role of Echocardiography in assessment of Burn patients to determine perioperative risk in comorbid patients.

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Introduction

Patients with Burn injury usually die from Multi organ failure or sepsis, and patients with burn injury may have pre-existing cardiac disease which places the patient at higher risk of a poor outcome. Cardiac disease is particularly associated with increased falls and syncope, a cause of injury commonly seen in the elderly burn patient. These patients may have a worse outcome, and we routinely organise cardiology performed Echocardiography as part of their assessment on presentation. We reviewed the electronic record of all patients who had Echo performed following presentation.

Methods

Using Hospital In-Patient Enquiry (HIPE) Scheme data we identified all patients undergoing formal cardiology performed Echocardiography ECHO over a five year period Oct 2016- Nov 2021. Outcomes included patient demographics, comorbidities, TBSA, adequacy of the investigation, clinical relevance, surgical treatment and outcome. All patients were considered as to indication for Echocardiography.

Results

53 patients who were identified as having a cardiology performed ECHO over this period. 53 had transthoracic ECHO performed and three had additional Trans oesophageal ECHOs performed (TOE). Two patients who had ECHO performed were quickly identified as having severe hypoxic brain injuries, and were excluded from further analysis.

Those who had ECHO initially were an older cohort 69.8 IQR 58-81 Average TBSA burn was 7% . IQR 2-6 % TBSA. (Range 0.25-70%) The average modified Baux was 74.5

Given the patients were older, many also had multiple significant pre-existing comorbidities. Only six patients had Normal Echo cardiograph findings. Of those recorded the average Ejection fraction was average 48% . Two had ejection fractions less than 30% , 6 patients had ejection fraction less than 40%. 30 patients had significant findings including valvular dysfunction and kinetic abnormalities . Decision not to treat was made in one case, a woman with significant comorbidities. All investigations were discussed through the MDT, and those deemed at higher risk for surgery had non operative, though active treatment. Although the majority of actively treated patients underwent surgical debridement. 35/50 (70%) a significant number of actively treated individuals were managed non operatively 15/50 (30 %). Overall mortality in those with decision to treat was 1/ 50 (2%), an eighty year old man who had surgical debridement of a 20% burn. No individual died with mBaux < 100.

Discussion

Cardiac ECHO provided useful findings which allowed identification of high risk patients, to better plan treatment course and inform decision regarding the timing of operative intervention. We believe that it is important to accurately assess complex comorbid patients and discuss patient management through the burn MDT to allow optimal planning and achieve best outcome.

Developing Sierra Leone First Sustainable Burn Services. The . Challenges and Opportunities

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Introduction

Burn injury is a major cause of mortality worldwide, but particularly so in Low middle income countries. One such country is Sierra Leone, a west African Country of almost 10million people. Recently the first two surgeons trained in Plastic and reconstructive surgery returned to Sierra Leone to build a national burn service. We present the logistical challenges, infrastructure needs, and care pathways, and partnerships on our path to building a national service

Methods

WHO and Lancet publications have for many years highlighted the deficiency of specialist care in Sierra Leone. We describe the required elements to build a Multidisciplinary team in Burn care. Identifying partners, and building a team. We also describe details of the first year when both surgeons returned, with a massive disaster, and the subsequent opportunities which have been provided. We also describe the subsequent activity, and the role of prevention, emergent treatment and reconstructive surgeries.

Results

More than 300 patients have been treated at the combined health facilities. With a great proportion of this number immediately following the fire disaster. However there has been increased awareness and services now include Critical care .

Discussion

Significant advances have been made, with long standing durable partnerships with Ghana India and the United Kingdom. Many patients treated are complex in an advanced western service, but using principles of reconstruction we have surmounted many challenges. Challenges remain, human resources, equipment and clinical, However each challenge presents an opportunity, and we present our strategy to harness international opportunities.

Predicting Elderly Burns one-year survival rate in Ireland - the incorporation of the Frailty score

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Objectives: to compare the efficacy of current burns scoring systems and the use of a frailty score in predicting 30-day mortality in older burns patients (65+) admitted to a National Burn Service. **Methods:** Retrospective analysis was performed on recorded electronic patient data admitted to the National Burns Unit in Dublin. All patients aged 65 and over admitted between February 2016 to March 2020 were included. Patient demographics, burn injury characteristics, comorbidities & outcomes including mortality at 30 days were recorded. From this data the Abbreviated Burns Severity Index (ABSI), revised Baux (rB), Belgian Outcome of Burn Injury (BOBI), the Canadian Study of Health & Aging (CSHA) Frailty scores and Charleston Comorbidity index (CCI) were calculated for each patient. Data was analysed using SPSS v24. **Results:** 128 patients were included (M:F = 76:52, mean age \pm SD = 76.0 \pm 7.4 years). The mean Total Body Surface Area (TBSA) burn was 8.0% \pm 12.8%. Overall mortality within 30 days of injury was 10.9% (n=14). Mann-Whitney U Univariate analysis highlighted that deceased patients were more likely to have sustained: higher TBSA burns (p=0.000), higher rB (p=0.000) and higher CSHA Frailty score (p=0.001). When analysed further, those with an increased Frailty score were 4.65 (CI 1.4 -15.1) times more likely to die within 30 days of burn injury, whereas TBSA (%) and Age contributed Odds Ratios of 1.22 (1.1-1.4) and 1.22 (1.03-1.45) respectively, showing that frailty contributes the most significant impact in an older patient cohort. This effect is most evident with Frailty score >5. There was a significant association between the CCI and the Frailty score. **Discussion:** In our cohort, the rB was the best overall predictor of burn mortality (AUC 0.94). Increased frailty was associated with increased mortality at 30 days. A tipping point was noted with a frailty above 5 having a significantly worse outcome. This study demonstrates the importance of assessing frailty in the elderly burn cohort. Consequent to COVID-19, independent activity and social interactions have been curtailed. We believe that the CSHA frailty score will become a more prominent tool for management planning for elderly individuals, especially those post COVID-19 infection. **Conclusions:** We recommend that frailty assessment is incorporated into the decision-making process following burn injury, so as to better inform patients, families & healthcare staff regarding patient prognosis and allow more informed healthcare decision-making. Frailty needs to be highlighted internationally as a contributing factor in burn survival.

The Role Of structural Fat Grafting in Burn Reconstruction

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Introduction

Structural fat grafting has been shown to improve scar quality, and function. It is recognised that certain sites in the body, such as the abdomen have high proportions of adipose derived stem cells.

In addition to the physical effects of introducing fat into scar tissue is the potential effect of adipose derived mesenchymal stem cells to modulate burn scar tissue and to influence repair and regeneration. Adipose derived stem cells have the potential to differentiate into many cell types and differential gene activity determines whether cells remain in a stem cell state or differentiate into specific cell types.

We have included structural fat Grafting in our service over the past 10 years, and have reviewed the outcome.

Methods.

All patients undergoing structural fat grafting for burns were identified. Where possible objective scoring systems such as POSAS were used to better determine outcome. Further objective tools included Goinometry, DASH , Michigan score and Cutometry

Results.

One hundred patients had structural fat grafting performed as part of their burn scar treatment. The treatment was well tolerated, however a number of minor complications resulted in a change in the technique from radical subcision to needle injection. Upper limb showed significant improvement if POSAS scores.

Discussion

Injury such as burns heals by a process of inflammation and scarring, with permanent loss of skin constituents. Adipose derived stem cells therefore offer an opportunity to change the scar milieu and improve the consequence of burn scar through repair and regeneration.

Burn injury prevention in low- and middle-income countries: scoping systematic review

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Introduction

In many countries, burn injuries remain a leading cause of morbidity and disability, however low- and middle-income countries (LMIC) have a disproportionately higher burden of disease. Despite the track record of burn prevention programmes successfully reducing the incidence of burns in high income countries, their implementation and evaluation in LMIC have been limited. The objective of this scoping review and narrative synthesis was to summarise and understand the initiatives that have been carried out to reduce burn injuries in LMIC and their effectiveness.

Methods

Publications which described studies of effectiveness of burn prevention interventions applied to any population within a LMIC and their measured burn incidence or burns-related outcomes were identified from three sources. Firstly, data was extracted from manuscripts identified in the systematic review published by Rybarczyk et al. in 2015. A search for manuscripts on burn prevention interventions published between January 2015- September 2020 was then performed. Finally, data was extracted from two systematic reviews where burn evidence was not the primary outcome, which were identified by senior authors. A quality assessment and narrative synthesis of included manuscripts was performed.

Results

A total of 24 manuscripts were identified and categorised according to intervention type. The majority of manuscripts (n=16) described education-based interventions. Four manuscripts focused on environmental modification interventions and four adopted a mixed-methods approach. All of the education-based initiatives demonstrated improvements in knowledge relating to burn safety or first aid, however few measured the impact of their intervention on burn incidence. Four manuscripts described population-based educational interventions and noted reductions in burn incidence. Only one of the four manuscripts describing environmental modification interventions reported burns as a primary outcome measure, noting a reduction in burn incidence. All mixed method interventions demonstrated some positive improvements in either burn incidence or burns-related safety practices.

Conclusion

There is a lack of published literature describing large-scale burn prevention programmes in LMIC which can demonstrate sustained reductions in burn incidence. Population-level, collaborative projects are necessary to drive forward burn prevention, through specific environmental or legislative changes and supplementary educational programmes.

The effect of Endermologie treatment on scar quality from patient and clinician perspectives using the patient observer scar assessment scale (POSAS).

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Introduction:

Endermologie is a machine created by, and named after Louis Paul Guitay (LPG), a French engineer that developed the machine based on his own experience with rehabilitation and scarring of the skin. It is a non-invasive treatment the consists of suction and the use of mechanical rollers to replicate soft tissue massage for the purpose of skin rejuvenation and improvement in scar quality.

Objective:

The objective of this study is to investigate the effect of Endermologie on the quality of thermal scars using the POSAS. This outcome measure considers the perspective of the patient and the observer or clinician.

Methods:

The study took place in the physiotherapy department of the National Burns Unit in St. James's Hospital, Dublin. The specialist burns team referred appropriate patients with healed and stable scars to the physiotherapy team for LPG treatment. Patients received ten sessions of LPG treatment that varied in intensity and duration depending on the sensitivity and surface area of the scar. The primary outcome, the POSAS, was assessed pre and post the 10 weeks of treatment. Patient also had photographs taken of their scar pre and post treatment by clinical photography as a secondary outcome measure.

Results:

Data collection is still in progress. The results of five subjects are currently available and preliminarily results are presented below. The results of approximately 15 subjects are expected to be collected by June 2023. Version 2.0 of the POSAS was used and there is currently no available data on the minimal clinically significant difference for this outcome. The patient scar assessment scale (PSAS) demonstrated a mean improvement of 22.2 points, a 37% improvement. The observer scar assessment scale (OSAS) demonstrated a 12-point improvement, a change of 20% (Table 1).

When data collection is completed of all patients in the coming weeks, a paired t test will be used for data analysis and to calculate significance.

Conclusions:

Results to date demonstrate that Endermologie can effectively improve scar quality from the perspective of the patient and the clinician. There was a more significant improvement in the patient score. A patients view of their scar characteristics is important in maintaining function, mentality and quality of life.

A case series using acellular dermal matrix fish skin in reconstruction of full thickness wounds

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Introduction

The current trend of burn and wound care has shifted to more holistic approach of improvement in the long-term form and function of the healed burn wounds and quality of life. The emergence of various skin substitutes has aided the management of burn and traumatic injuries. Acellular dermal matrix fish skin grafts (FSG) have emerged as one of the options in the surgeon's armamentarium to reconstruct complicated defects. The biodegradable dermal substitute with its porous microstructure supports cellular ingrowth, incorporation, angiogenesis, and granulation of the exposed wound bed.

Methods

This retrospective review was conducted in a single, ABA-verified Burn Center and included complex full-thickness (FT) burn, traumatic or chronic wounds treated with FSG. Patient charts were reviewed to assess demographics, time to graft, mechanism of injury, comorbidities, follow-up duration, outcomes, and complications. Additionally, photographic images were obtained from the medical record for each patient to assess clinical progression of healing.

Results

The series comprised of six patients (5 were male) totaling 8 separate, FT wounds with a median age of 49 (40, 60.25) years. Each patient had at least one chronic comorbidity, including half with morbid obesity and one with diabetes. All but one wound (e.g., siliconoma) resulted from acute traumatic injuries and site varied with most involving an extremity. Median excision-to-FSG application time was 6.5 (5.5, 8) days. Of the 8 applications, only one FSG failed secondary to a multi-drug resistant Pseudomonal infection. For the other 7 successful applications, there was no unexpected adverse events including erythema, irritation, or drainage, and median FSG-to-split thickness skin autograft time was 14 (13, 19.5) days. FSG was noted to integrate into the wound bed with noticeable granulation in 7-10 days.

Conclusions

Full thickness traumatic and burn wounds are challenging to treat when flap based reconstructive procedures are an unavailable consideration. Wound coverage is also necessary to prevent infection, desiccation, and osteomyelitis in scenarios where tendons or bone remain exposed. FSGs are a strong pliable xenograft capable of creating a wound bed and timely coverage of critical structures, allowing for subsequent skin-grafting in a properly selected and challenging population.

Applicability of Research to Practice

Skin substitute FSG was used to help achieve expedited wound closure in candidates where flap options were unavailable.

Funding for the study

None

Poster Presentation Abstracts

1

Using narrative EMDR to treat psychological trauma in a toddler with a burn injury - a case study

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Introduction:

Treating psychological trauma in infants can sometimes be tricky. NHS burns departments treat many patients from this age group as it is common for curious toddler hands to pull hot drinks over themselves, resulting in scald injuries. This case study highlights the benefits of using a Narrative Eye Movement Desensitization and Reprocessing (EMDR) approach to treat infant psychological trauma from a scald injury, by a Clinical Psychologist trained in EMDR.

Method:

Charlie (pseudonym) presented to Paediatric Psychology aged 3 years, having had a scald injury 8 months previously. His parents worried that he now appeared to be scared of 'everything' – he couldn't be left with anyone apart from parents, was anxious around other children, had a fear of appointments (e.g. dentist, GP), and was very clingy with his Mum. A developmental screening was conducted which didn't flag anything of note. A trauma history was taken from Charlie's Mum and Dad, and their own parental trauma was assessed. A rationale for the approach and psychoeducation about EMDR was provided to the parents.

Progressive muscle relaxation was introduced to Charlie and he enjoyed learning how to 'relax like a cat'. Charlie was also able to engage in an exercise where he created an imaginary 'safe space'. His safe space was a peaceful treehouse with a cosy den inside, and he was able to close his eyes and imagine this when he was feeling overwhelmed. Charlie's parents were also provided with coping strategies and resources.

A narrative (an age appropriate story about the injury) was then created with Charlie's Mum. The story will be presented in full on the poster. This narrative was read out to Charlie whilst he sat on his Mum's knee by the Clinical Psychologist, as his Mum tapped his shoulders bilaterally. The Clinical Psychologist monitored Charlie's processing, and advised his Mum to alter the speed of her tapping accordingly. Guidance for the work was taken from Joan Lovett's Small Wonders book. At the end of each session, Charlie would be encouraged to either do some relaxation exercises, to think about his safe space, or to 'shake out the wriggles' by engaging in fun physical activity such as dancing or jumping.

Results/Discussion:

Following five short (20 min) EMDR sessions, parents reported that Charlie seemed much more confident and outgoing. He was playing with other children in the park and had started nursery successfully. His 'clinginess' had been greatly reduced, and he was able to be cared for by other trusted adults aside from his parents. He had attended GP appointments with his Dad and had watched him having a blood test, which would have resulted in 'totally meltdown' prior to intervention according to Mum. Charlie's parents were relieved that they had got their 'old Charlie' back and didn't feel that further intervention was necessary.

Conclusion:

The patient's psychological wellbeing improved greatly in a relatively short number of sessions. Narrative EMDR can be a useful approach for treating psychological trauma in infants who have experienced a burn injury.

3

A review of first aid documentation and accuracy of burns size estimation in referrals to a regional burns centre

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Introduction:

Prompt and effective delivery of burns first aid can significantly impact on burn outcomes and reduce patient morbidity. Patient and staff understanding of this is therefore critical. The purpose of first aid is to remove heat, reduce pain and reduce oedema by stabilising mast cells and histamine release. Clinically, it can minimise the need for surgical input and reduce the length of inpatient stay, secondarily reducing NHS costs and resources.

Purpose of the study:

We audited our regional burns service delivery for adult patients admitted between 1st January 2019 to 31st December 2021 and assessed whether first aid was documented and correctly applied for these admissions. Gold-standard used was the British Burns Association guidance; "First aid should be 20 minutes of cool running water within three hours of the injury. If delayed presentation, it would be acceptable that it is not administered". We also assessed whether burns assessment of total body surface area (TBSA) was correctly estimated by the referring team in comparison to burns centre review.

Methods:

A total of 494 inpatient adult admission records were reviewed with the following data collected; patient and burn demographics, burn size estimation at the referring site, burn size assessment by our regional burns team, whether first aid was documented including method, duration, and time of presentation, and whether first aid was administered by the referring site if not actioned by the patient themselves within three hours of injury.

Results/Discussion:

In the 3-year cohort, 34% were female, 66% male, with an average age of 47 (range 16-98 years). A yearly average of 164 patients were admitted. The majority of admissions (56%) were admitted to our regional burns centre, and the most common type of burns injury were scalds (27%), followed by flame (21%) and flash burns (14%). Most referrals came from the emergency departments (ED) in the Newcastle area.

A total of 66 patients had a referring estimation of TBSA documented, with 39% accurately matching assessment made by the burns team, determined as +/- 2% of the estimated size. First aid was documented for 54% of patients and correctly applied for 27% with the most common method reported as cold-water

application or submersion, followed by use of a damp item such as wet flannel. Most patients had >20 minutes duration (26%), with 19% as <20 minutes duration and 23% with no first aid. 23% had a delayed presentation, classed as >3 hours post-burn injury. Substantial TBSA estimation differences were noted for nine patients, six of which had TBSA estimation of >10%, later determined by our burns team to be <10%, and resulted in unnecessary initiation of fluid resuscitation in four of these cases.

Conclusion:

First aid understanding and application is globally poor amongst the public and non-burns medical staff, requiring further targeted education. TBSA estimation can also be improved upon with ED staff education. Documentation rates for first aid and referring TBSA could also be improved upon to identify which groups this targeted intervention could benefit.

5

Sodium-Glucose Cotransporter 2 Inhibitors causing Fournier's Gangrene as a Life-Threatening Adverse Event: Are we watching closely?

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(a) Introduction

Fournier's gangrene (FG) is a rare but life-threatening genital infection that can occur in vulnerable patients, especially diabetic patients. Literature evidence is suggesting that novel diabetic medication Sodium-glucose Cotransporter-2 (SGLT2) Inhibitors can cause Fournier's gangrene.

(b) Purpose of the study

To report on new cases of FG related to the use of Sodium-glucose Cotransporter-2 (SGLT2) Inhibitors and review current literature evidence.

(c) Methods

In this article, we report two cases of patients we treated within one month of each other with Fournier's gangrene who were using Sodium-Glucose cotransporter 2 (SGLT2) inhibitors. We also look at the current literature and what evidence we have so far so we can shed light on this class of medications and make sure we are taking enough precautions to protect vulnerable patients.

(d) Results

Overwhelming evidence has been reported connecting Fournier's gangrene with the use of Sodium-Glucose cotransporter 2 (SGLT2) inhibitors.

(e) Conclusion

The rising number of FG cases since the introduction Sodium-glucose Cotransporter-2 (SGLT2) Inhibitors should be alarming to the prescribing physician and patients should be evaluated carefully for their risk factors for Fournier's gangrene. Surgeons should suspect the incidence of Fournier's gangrene in any patient presenting with signs of sepsis and signs of genital infection and using Sodium-glucose Cotransporter-2 (SGLT2) Inhibitors. Patient education about the risk is needed to initiate prompt diagnosis and treatment.

After life-saving measures like surgical debridement and antibiotics, the SGLT2 inhibitor agent should be discontinued and alternative therapy for glycaemic control should be provided.

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Effects of flaxseed oil and olive oil on markers of inflammation and wound healing in burn patients: A randomized clinical trial

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Abstract

Objectives: Due to the high cost of burns in developing countries, medicinal herbs can be safe, inexpensive, and effective alternatives to pharmaceutical drugs. In this study, the anti-inflammatory and antioxidant effects of flaxseed oil and olive oil on inflammatory markers were studied to facilitate wound healing.

Methods: 112 patients with a total burn surface area (TBSA) of 20–50% were randomly selected into four groups, including olive oil (OO), flaxseed oil (FO), a mixture of olive oil and flaxseed oil (OF), and control group and received 30g of oils for three weeks. Serum high-sensitivity C-reactive protein (hs-CRP), ferritin and albumin level as inflammatory markers, as well as cholesterol, triglyceride, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) as the lipid profile were explored. Wound healing was assessed by photographing on days 2, 8, 15, and 22 (during three weeks of intervention) and was analyzed in ImageJ software.

Results: The greatest reduction in the level of hs-CRP and ferritin was observed in the OF (-21.38 ± 44.41) (-132.79 ± 165.36), while the lowest reduction was reported in the control group (-36.36 ± 79.03) (141.08 ± 262.36). Compared to the control group, OO significantly increased albumin (0.88 ± 0.65). The reduction of wound healing at the end of the first week of intervention was not significant in the study groups. However, the stereology examination showed significant improvement in wound healing at the end of the second and third weeks in the OF.

Conclusion: Based on the findings, the combination of herbal oils reduces inflammation and improves wound healing, and showed positive effects on the size of wounds in burn patients.

Keywords: Flaxseed oil, Olive oil, Burn wound, Inflammation indices.

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Elevate and squeeze: the treatment and prevention of oedema in upper limb injuries.

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Introduction:

From June 2019, our burns centre introduced new protocols for oedema management in the extremities. This new practice came about after two senior therapists within the burns service attended a training course on 'the management of the burned hand'. Following this development, the entire burns multidisciplinary team (MDT) was educated on the significance of oedema management to prepare the wound bed for more accurate tangential excision during surgical debridement. The team agreed on some principles for the consistent delivery of oedema management to all suitable patients. For patients with contra-indications to our method of oedema management, we used our approach with caution.

Purpose of study:

To share our approach and experience with oedema management in upper limbs.

Method:

All admissions to the burns centre with limb burns requiring surgical debridement presenting with peripheral oedema are commenced on the oedema treatment pathway. Oedema is identified via clinical assessment, including observation, palpation and sometimes using figure-of-eight circumferential measurement.

Precautions for delivery of oedema management are recorded following clinical review. These include presence of peripheral vascular disease, active infection or cellulitis, high inotrope requirements, tension within muscle compartments or poor peripheral circulation on assessment.

Suitable patients are started on the oedema management pathway. Interventions for oedema include:

- Gentle elevation to heart level in an 'aeroplane' position with shoulder abducted at 90°; whilst maintaining extension at elbow, wrist and digits.
- Regular active range of movement exercises, where safe and realistic to do so, to stimulate the muscle pump. This is substituted with passive exercise if necessary.
- 3M™ Coban™ application with gentle 'pinch-to' technique, working from distally to proximally, encompassing tips of digits where able.

These oedema strategies are continued pre and post-operatively.

Results:

Clinically we have seen a reduction in excess oedema in the extremities, reducing the functional impact on our patients. Active range of movement and function are maximised pre-operatively. Reduced pre-operative oedema allows more selective surgical debridement, minimising trauma and the inflammatory response. Furthermore it improves graft take and promotes early wound healing, which contributes to the reduction in hypertrophic scarring, particularly in hand burns.

Discussion/Conclusions:

Our findings demonstrate how simple and cost-effective interventions to reduce the risk of developing oedema or modulate the formation of excess oedema, delivered with a collaborative MDT approach, can reduce the risk of debridement of healthy tissue, improve the graft bed and encourage early wound healing. Although some patients may not be clinically appropriate for all elements of the pathway, a graded introduction of oedema management, with close monitoring can be beneficial. Our practice of early oedema management reduces the inflammatory burden, resulting in improved scar cosmesis.

A Very Unusual Burns Complication: Bilateral Endogenous Bacterial Endophthalmitis

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Introduction: We report the rare, but potentially blinding, complication of bilateral endogenous bacterial endophthalmitis observed in a 35-year-old male during his admission to a regional burns centre, following a burn injury from an electronic cigarette device. Given the significance and rarity of this condition, we have provided a detailed clinical report of our experience. Although burn wounds are initially sterile following thermal injury, they can become colonised with gram positive, gram negative, and fungal organisms, leading to systemic bacteraemia and sepsis in some cases. Endogenous bacterial endophthalmitis occurs when such microorganisms enter the eye crossing blood-ocular barrier via haematogenous spread from a distant source of infection. It is a potentially sight-threatening ophthalmological emergency with a poor visual prognosis in most patients.

Purpose: The objective of this report and abstract is to raise awareness of this potential complication in the burn patient population, to encourage early diagnosis and appropriate prompt treatment to prevent loss of vision.

Methods: The patient described in this report was a fit and well 35-year-old male patient who presented to the emergency department after sustaining a 5% TBSA flame burn to his left thigh and leg when a lithium-ion battery powered electronic cigarette in his pocket spontaneously caught fire. Four days following the presentation, the patient underwent uncomplicated surgical debridement, dermabrasion, and reconstruction of the burn with a split thickness skin graft. In the postoperative period he developed sustained pyrexia >39 degrees celsius, bilateral eye pain, redness, and photophobia, whilst remaining clinically stable with no other source of infection. He was subsequently diagnosed with bilateral endogenous bacterial endophthalmitis presumed secondary to a *Staphylococcus aureus* infected burn wound. After ophthalmology input and treatment with systemic and intravitreal antibiotics, he made a full recovery from both his burns and endophthalmitis.

Results/Discussion: Serial ophthalmology assessments showed steady improvement of his uveitis activity and eye examination one month later was completely normal. His burn and split thickness skin graft healed well following surgery. This is the first case report of endogenous bacterial endophthalmitis developing following a minor burn injury; two previous cases document this condition secondary to systemic infections in major burns greater than 40% TBSA. This clinical case should highlight to burn surgeons around the world the potential for patients to develop this sight-threatening condition.

Conclusion: This report describes a rare, site-threatening complication that arose from an infected burn wound in a fit and well patient following standard burn management. It highlights the importance of prompt diagnosis and treatment to preserve vision, and the need for burn surgeons to have a high level of awareness of this entity, even in the context of minor burns.

The challenge of burn itch - a non-pharmacological approach

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Introduction

Burn pruritus (itching) is a common and distressing side effect of burns of any size or depth. It can significantly affect the patient's quality of life after a burn injury, lead to lack of sleep and impact on wound healing due to subsequent scratching and break down of wounds.

Many patients report the itch phase to be equal or more distressing than the pain of the burn injury itself. Medications such as anti-histamines are commonly prescribed, but vary in effectiveness. However, there are many other practical approaches that can be used with good effect.

Purpose

To explore options, other than medication, to help patients manage burn itch by engaging the wider burns team and working in partnership with other agencies such as burn charities and medical companies.

Methods

A working group consisting of a consultant, therapist, senior nurses and pharmacist, devised a "Best practice guideline" for managing burn itch, considering available research and including practical advice and concepts.

This included engagement with medical companies to identify appropriate dressings, and communication with local companies who have produced devices that assist with massage and itch management.

An additional "Itch passport" document was also produced.

As a result of close collaboration with the Children's Burns Trust (burn charity), a short video entitled "The challenge of burn itch" was produced using patients and families to ask and answer key questions on the topic.

Results

The "Best practice guideline" serves as a useful prompt to ensure clinicians consider a practical approach alongside a pharmacological approach to managing burn itch.

The "Itch passport" ensures consistent, clear communication and a methodical approach is used to identify effectiveness of interventions.

The patient information video is a useful resource for families to access.

Discussion

Burn itch is widely recognised as a common phase of a healing burn and as such should be anticipated and managed accordingly. It is important to communicate with patients and families and provide them with practical advice such as rehydrating moisturising creams, using bath emollients, cotton clothing, keeping nails short and applying cool compresses for healed wounds.

It is also important that itch is anticipated in the healing wound and early management with appropriate creams and dressings is implemented. Exudate control is also a key consideration in itch management.

Working in partnership with other organisations such as medical companies and burn charities ensures a rounded, holistic approach is used, and moves the focus of treatment away from purely pharmacological.

Conclusion

Appropriate management of burn itch greatly influences patient experience and wound healing. It is an essential part of burn care and should be prioritised alongside control. An early holistic approach is key to successful itch management.

Retained staples in healed burn wounds - an accepted risk or poor practice?

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Introduction

The potential for retained staples after burns surgery is a known complication. However, the impact on the patient can be significant. Delayed wound healing, areas of over-granulated tissue, pain and increased risk of infection are common.

Sometimes it is necessary for the patient to require general anaesthetic to remove the retained staples and allow complete wound healing.

Following a recent increase in retained staples in slow to heal burn wounds, a comprehensive review was carried out to identify any potential areas of improvement in clinical practice.

Purpose

It was important for the burns team to understand why there was an apparent increase in staples being retained in burn wounds, to critically review our processes and to reduce the incidence of retained staples in future patients where possible.

Methods

A comprehensive review of the care for each patient was carried out, including a critical appraisal of the nursing and medical documentation, and current practice. The results were shared at a Burns Mortality and Morbidity meeting and during the subsequent discussion themes were identified for shared learning.

Results

A number of key points in current practice were identified as being contributing factors to retained staples. The findings led to the production of several new documents: "Care of staples in skin grafts", "Guidelines for the identification of staples in non-healing burn wounds" and "Competencies for the care of staples in burn wounds"

Discussion

An increase in multiple retained staples (8-10) particularly in lower leg wounds possibly indicated that staples were not being removed in a timely manner. It was also possible that a larger than usual amount of staples were being used to secure the grafts.

A change in approach to a more patient-led dressing experience, may have resulted in an increased risk of retained staples, as nursing staff were encouraged to stop procedures if the patient expressed distress or discomfort. Therefore, education around appropriate analgesia for staple removal was required.

A new rotation of both medical and nursing staff indicated that there may be a need for further training, and therefore competencies were produced and internal training provided.

Documents and clear guidelines for management of retained staples in non-healing wounds were also produced.

The importance of gaining consent and documenting the potential risk of retained staples on the written consent form was raised, alongside the need to assess each patient individually for appropriateness of using staples. For example, staples should be avoided in patients who may be unable to tolerate removal in the ward setting, or those with mental health concerns.

Conclusion

The impact of retained staples on the patient is significant and often results in a painful, non-healing wound. A comprehensive review of our processes and documentation, and engagement from the Burns MDT resulted in some changes to practice and the production of new guidelines and competencies which will reduce the risk of retained staples and improve patient experience.

Paediatric Burns Nursing: What is a paediatric burns nurse and with so few how do we meet the Burn Care Standards (2018)?

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Paediatric Burns Nursing: What is a paediatric burns nurse and with so few how do we meet the Burn Care Standards (2018)?

The aim of the paper is to address how we recruit, train and retain specialist paediatric nurses throughout the UK. We will share our experiences of setting up a dedicated Paediatric Burns Nurse team at the Welsh Centre of Burns and Plastic Surgery. Addressing the challenges faced by burn services in ensuring suitable qualified nurses that meet Burns Care Standards and ensure the “right nurse, right skills, right place.” This has proved to be a huge challenge when there are currently 567,291 adult nurses and 55,062 paediatric nurses registered with the NMC. Far fewer paediatric nurses to recruit and train, to become a paediatric burns nurse.

Paediatric nursing is a unique and specific role within nursing. It is not just caring for a child from birth to adulthood and sometimes beyond but caring for the whole family. With legislation around paediatric nursing, the need for children to be cared for separate to adults, has left many services needing to evolve and change the way children and young people with a burn are cared for.

The primary question we initially needed to establish is what is a paediatric burns nurse? Following scoping exercises and liaison with the network it was understood to be, firstly someone who has undergone a paediatric nursing qualification and is registered with the NMC as a RNC or equivalent. Secondly, this nurse needs to have worked in burn care and achieved all their work related burn competencies, finally they need to have undertaken a level of academic training in burn care such as the EMSB or an accredited burns module/course. Obviously very few nurses meet all of the requirements to be classed as a paediatric burns nurse.

Having established what a nurse is the next step was to identify how we train and retain specialists’ nurses. A scoping exercise was undertaken to establish how many nurses within the service met the criteria, once established we then needed to benchmark how many would be needed to meet the standards and how to address this to ensure there would always be a burns nurse available for all paediatric burns.

As there are so few, the nurse needs to be able to look after children from outpatients right through to intubate and ventilated requiring transfer to a burns centre, this is a large area and scope of practice. Staff therefore need a significant level of investment and training to achieve the gold standard of a paediatric burns nurse. Achieving this will incur a huge financial burden to the service for so few patients.

Following completion of the work the question is will services be able to maintain and continue to meet, and address the standards with so many vacancies for nurses and a mass of opportunities, and how can we attract paediatric nurses to the burns service and a career in paediatric burn care.

Experience with a Biosynthetic Cellulose Dressing (Epiprotect) at a Regional Paediatric Burns Unit

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Introduction

Epiprotect is a biosynthetic cellulose dressing utilised as treatment for partial thickness burns and a temporary dressing for full thickness burns. We present one of the larger case series on the topic entailing our experience and evaluating its utilisation.

Purpose of Study

- 1) Evaluate the utilisation of Epiprotect in paediatric patients of a wide age range with burn injuries of varying total body surface area percentage (TBSA %), depth, and anatomical distribution.
- 2) Establish the feasibility of routine Epiprotect application and same day discharge with outpatient first check at 48 hours unless discharge inappropriate for other reasons.

Methods

At our institution, Epiprotect is applied within 24 hours of injury under oral sedation +/- oral analgesia in a specialised dressings room within the unit incorporating a two person technique (sterile, unsterile) with standard burn wound assessment/care otherwise. Patients do not undergo application under general anaesthetic or in theatre routinely. First check is performed at 48 hours with no standardisation at the time of this study whether patients were to be discharged or remained as inpatient for the sole purpose of the first Epiprotect check.

A retrospective analysis of medical notes was conducted for a cohort of 39 paediatric burn patients who underwent Epiprotect application between December 2020 – February 2022.

Results

Thirty Nine (n=39) patients aged between 5 weeks to 16 years old (mean; 3 years old) with a TBSA % ranging from 1% -14% (mean; 5%) underwent application of Epiprotect for predominantly superficial partial thickness burns (74% of injuries) sustained mainly as scalds (95% of injuries).

Mean time to healing was 15 days with 3 patients requiring surgery for unhealed/deeper areas.

Application of Epiprotect was well tolerated in all patients with only two patients experiencing complications at the first check in the form of displacement requiring reapplication. No other complications were identified.

In terms of admission, 62% of cases remained as inpatient till the 48 hour check was conducted, 13% were discharged the same day of application and the remaining 25% required admission for other reasons such as safeguarding, size of burn or late hour of application. Mean length of stay was 4 days with an outlier patient who remained an inpatient for 26 days due to a large burn requiring resuscitation and surgeries.

Conclusion

Epiprotect can be feasibly and safely applied with same day discharge and first check performed as an outpatient in 48 hours. Adding to a standard operating procedure that minimises use of theatre space and general anaesthetic, this has potential to reduce length of stay and facilitates availability of sparse inpatient paediatric burn unit/centre beds.

We will prospectively audit the outcomes of standardising same day discharge for Epiprotect application in paediatric patients where appropriate and present our findings in the future.

Exploring the similarities and differences of variables collected by burn registers globally: protocol for a data dictionary review study

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Introduction:

Burn registers exist in multiple countries throughout the world, allowing for collection of patient and injury data to guide prevention, quality assurance and outcomes assessment. Despite their widespread use, there is no recommended or standardised set of variables to be collected which may limit international comparisons of data.

Purpose:

Creation of a study protocol to gather and compare the variables collected by burns registers internationally to understand their similarities and differences.

Methodology:

Country-wide and inter-country burn registers will be approached via data custodians for inclusion in the review and asked to supply their data dictionary. Inclusion and exclusion criteria for patient entry into the register will be compared. All variables detailed in the data dictionaries will be extracted and analysed for common variable themes by two researchers. Presence of required or optional variables will be recorded. Detailed information on definition, method of measurement and timing of measurement will be extracted for a sample of common topics (age, timing of injury, mechanism, intent, inhalational injury, infection, and survival) and will be compared across all registers. No patient identifiable data will be collected or analysed. Extracted data dictionary information will be analysed for agreement between the two researchers, with a good level of agreement defined as a kappa statistic >0.60.

Discussion:

Training exercise data suggests some similarity exists in patient demographic and injury data collected across registers, with greater heterogeneity in healthcare process measures and patient outcome variables. There are differences in the detail provided in data dictionaries, such as variable definitions, measurement methods and timing of data collection. Differences in variables collected could introduce bias into analyses if data were compared across registers.

Conclusion and applicability to clinical practice:

The authors hope that by identifying the current global practices surrounding burn injury registers, a recommendation can be made for universal definitions of key variables. Standardised methods of measurement and recording of significant data points would enable international comparisons to be made as well as aiding those countries wishing to create their own register.

Group-based Metacognitive Therapy for Burns and Plastics Patients: A Feasibility and Acceptability Study

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Following burn injuries or other illnesses or injuries requiring plastic surgery intervention, individuals commonly experience psychological distress such as trauma, anxiety and depression symptoms. Current guidelines recommend various psychological interventions based on the presenting problem, with limited effectiveness in reducing psychological distress. An alternative approach would be to target transdiagnostic processes underlying psychological distress, as is the case in Metacognitive Therapy (MCT). MCT works on reducing repetitive negative thinking patterns of worry and rumination. The aim of this study was to assess the acceptability and feasibility of delivering group-MCT within a burns and plastic surgery service with patients experiencing psychological distress. Fourteen adult outpatients were recruited from the psychology service within the burns and plastic surgery department at a hospital in Manchester, UK. They were allocated to six sessions of group MCT. Acceptability and feasibility assessment was based on rate of recruitment, drop-out/withdrawal by the study end point (7-months), number of sessions attended, completion of follow-up, symptom outcome measures and ability of measures to discriminate between patients. We also examined adherence to the MCT treatment protocol by therapists. Attendance at group-MCT was high with 10 participants (71.42%) attending at least 4 out of 6 treatment sessions. Nine participants (64.29%) completed post-treatment outcomes at four-month follow up, and seven participants (50%) completed outcome measures at seven-month follow up, which fell below our target of 80% outcome measure completion rate. Measures of anxiety, depression and trauma symptoms demonstrated a range of values with no floor or ceiling effects. Therapist adherence to the treatment manual was high (92.60%). Group-MCT appears to be an acceptable and feasible treatment, but attention needs to be given to questionnaire completion rates. Group-MCT may represent an attractive psychological intervention for burns and plastics patients given it can be delivered to transdiagnostic groups with a range of psychological concerns post injury or illness. The findings from this study could be used to design future larger scale effectiveness trials.

Hot water bottle scalds. Are the numbers increasing?

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Intro: Scald injuries are a common cause of burn injury in children. With the cost of living increasing in the UK, alternative methods of keeping warm during the winter months are being employed with a potential increase in burns risk.

Purpose: To determine differences in rates of hot water bottle scalds between winter this year to previous years and to explore safety messages around these products.

Methods: A prospectively maintained burns database was reviewed to identify all paediatric cases (aged 0-16y years) presenting to the national burns centre with a hot water bottle scald mechanism of injury. Cases were reviewed in the cold months between the October – March over a 4 year period. Patients' demographic details and the distribution of scald injury were analysed.

Results: 29 patients with hot water bottle scalds were identified over a four year period. The mean average hot water bottle scalds per winter period were 6 in previous years (range 3-6). The number of hot water bottle scalds this winter period up until the point of abstract submission was 9. The most commonly affected body areas were the anterior torso and hands. Burns were mostly managed conservatively with the average of 3 visits to clinic. Only 2 patients required surgical intervention with split thickness skin grafting.

Conclusion: The use of hot water bottles in children with associated thermal injuries appears to be on the increase this winter. A greater awareness of the safety profile of these products needs to be brought to the attention of the public.

Quality of life of paediatric burn patients with non-severe burns in Western Australia.

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Introduction: Burns are common in Australia and worldwide, and the vast majority are non-severe burns of less than 20% of the total body surface area (TBSA). In Australia, paediatric burns account for a third of all burn admissions, thus understanding the quality-of-life outcomes after a non-severe burn in children is important.

Aim: To investigate the epidemiology of paediatric burn injury in Western Australia and to determine which demographic and clinical factors correlate with a low quality of life during recovery.

Methods: This retrospective cohort study describes a paediatric cohort from Western Australia with non-severe burns occurring between 2018 and 2020 and characterises the child's quality-of-life outcomes which is measured using the Paediatric quality of life survey (PedsQL). The PedsQL included a parent-report and child-report assessment, each with a physical function domain and a psychosocial function domain which comprised of an emotional, a social and a school category.

Results: Data collected from 249 patients; 50.6% were male, 45.6% were Toddlers. The most common cause was scald (48.19%), the majority had burns smaller than 5% TBSA (91.97%), and most included visible areas such as head, neck or hands (77.51%). The parent-report PedsQL scores were significantly different for both physical and psychosocial domains between the different age groups ($p = 0.002$, $p = 0.001$, respectively) and for burn cause ($p = 0.004$, $p = 0.005$, respectively). For child-reported scores there was evidence of an effect of burn cause across both domains that did not reach a statistical significance ($p = 0.076$, $p = 0.078$, respectively). The psychosocial functions in both the parent-report and the self-report were significantly different for the socioeconomic status groups ($p = 0.015$, $p = 0.032$, respectively). Quality of life scores were critically low in 16.46% of paediatric burn patients at three months after their burn.

Conclusion: Parent-reported and child-reported psychosocial function was significantly poorer in higher socioeconomic groups, for older children and for those with flame burns. About 16% of patients had scores below the critical cut off. This data provides an insight into the quality-of-life outcomes of paediatric patients with non-severe burns, therefore allowing future studies to investigate burn prevention strategies and services to help paediatric burn patients in their recovery.

The effect of burn injuries on the brain and behaviour

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Introduction: Burn patients, especially children, are more prone to mental health conditions following their injury as recently demonstrated using population-based studies in Western Australia. The inflammatory response to a burn, coupled to a leaky blood-brain barrier may lead to immune and inflammatory changes in the brain that underlie the long-term increase of mental health hospital admissions observed.

Aim: The aim of the study was to use a mouse model to: 1) investigate the changes in behaviour following burn injury, and 2) Determine the genes in the brain with altered expression following burn-injury.

Methods: Mice were allocated into three intervention groups; a burn group which received a non-severe burn injury 7-8% of the total body surface area administered under anaesthesia, an excision group which received a 7-8% wound to control for the effects of trauma without the burn, and a sham group that received the anaesthesia and no injury. Mice were tested through a series of behavioural tests before and after their intervention. Mice were euthanized 3 months after the burn injury and their brains were collected for genetic analysis through RNA sequencing.

Results/discussion: Behavioural tests showed no significant difference before and after the burns, however, significant changes were shown in genes associated with pathways of neurodegenerative diseases.

Conclusion: Burn injuries can cause physiological changes in the brain that are detectable in the brain's epigenetics 3 months after the burn. More investigation of the genetic pathways after burns is required to understand the impact of burn injuries on the brain to eventually be able to understand and treat the mental health conditions that arise after burns.

Management of delirium and cognitive impairment through use of sensory normalisation as an intervention.

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This project aims to develop a sensory-based approach to improve the patient experience in an adult burns unit. This specialist, multi-faceted resource will be developed in partnership with patients, relatives/carers and members of the multi-disciplinary healthcare team, and will provide a guide for occupational therapists to target their treatment interventions, in addition to supporting the wider MDT.

This specialist, multi-faceted resource will be developed in partnership with patients, relatives/carers and members of the multi-disciplinary healthcare team, and will provide a guide for occupational therapists to target their treatment interventions, in addition to supporting the wider MDT.

This project aims to establish preliminary proof of concept of a sensory-based resource that will:

- Increase understanding and awareness of the fundamental significance of sensory normalisation and how this might impact on the patient experience.
- Support multidisciplinary team members to build awareness and identify practical strategies in the management of sensory input, and reflect on how their clinical practice could be adapted to incorporate these activities into routine care.

Following a robust quality improvement methodology with embedded staff, patient and relative/carer involvement, we will:

- Undertake a series of co-design workshops with local stakeholders to develop a sensory-based resource to improve the patient experience on the burns unit. (This completed).
- Aim to pilot the sensory-based resource with 6-8 patients.
- Capture the views and experiences of staff, patients and relatives/carers taking part in the pilot site using a mixed-method questionnaire
- Refine the sensory-based resource based on stakeholder feedback prior to implementation and dissemination.

Evaluation of the project:

Three resources will be co produced and trialled on the burns unit. This will include a leaflet for relatives/caregivers, a This is me form for staff use and a poster for consideration of the burns environment. A pilot sample of 6 - 8 patients will be used to trial the leaflet and this is me form, questionnaires will be attached to the resources with the relative/caregiver completing the questionnaire attached to the leaflet and staff completing the questionnaire attached to the this is me form. Copies of the poster will be put up on the burns unit, one in the staff room and two in areas of the units where the posters would be

acknowledged. Feedback questionnaires will be left in the staff room to allow the feedback to be anonymous.

The results will be shown in the form of a graph and a word cloud which helps to capture any positive comments which maybe received in the feedback questionnaires.

Exploring differential misclassification bias of burn injury intent

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Introduction

Intent is recommended as the first level of classification of an injury. This information is particularly important to inform prevention planning. The highest proportion of suicidal and homicidal burns are thought to occur in South Asia, but there is a lack of surveillance data disaggregated by intent in this region. Where intent data is available, it is prone to misclassification for reasons such as stigma or fear of criminal investigation. These pressures apply at the level of the patient, healthcare professional, and coder. This makes intent an important, but potentially unreliable variable.

Aim

The aim of this project was to investigate if there are systematic differences in the way that intent has been recorded in a newly digitised burn register from a tertiary government burn unit in south India.

Methods

Six years of handwritten registers at a tertiary burn unit in south India were digitised after rigorously assessing the quality data collection processes. Preliminary analyses were completed on fully verified data (1930 patients, February 2016-2022). Descriptive analyses were conducted using Redcap and R with version control.

Results

We found three patterns of recording of intent data – complete, missing, or overwritten. 1.5% of cases were overwritten, meaning documentation of intent was changed. The most common change was from accidental to suicidal. Overwriting occurred more for larger burns, and female patients. This supports anecdotal reports from clinicians of female patients with large burns changing their account of the injury as it becomes clear they will die.

Intent data was missing in 13% of cases (Figure 1). It was 6 times more likely to be missing than any other variable in the register. Complete data was available for 87% cases of which 66% were accidental, 12% suicidal, 2% homicidal, and 8% other causes. We found the overall number of burn presentations is reducing but the proportion of complete and missing data is constant. Of the subgroups, there was a slight increasing trend in the proportion of ‘other causes’, which might reflect the reduced emphasis on in-hospital medicolegal processes since the decriminalisation of suicide in India in 2017. We found that for complete and missing data there were no differences in size of the burn, and only small sex differences.

Conclusion

Intent data is more likely to be missing and overwritten than other variables. This affects reliability of a data point that is recommended as essential for prevention planning. Although this is a single centre study, it is the first we know of to explore differential misclassification bias and report the characteristics of missing and overwritten data. Routinely collected data such as this may be useful for burns surveillance but understanding likely sources of bias is essential when being used to inform prevention strategies.

Future work will include the development a causal model to predict intent. Data driven techniques however, should not replace ensuring reliability at the point of data collection. This could be strengthened with internationally agreed definitions and method of determination of intent.

Exploring associations between ethnicity and referrals, access and engagement within an adult burns clinical psychology service

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Introduction: Ethnic inequalities exist across healthcare, including access to, experiences and outcomes of mental health services. Access to and opportunities to engage with burns clinical psychology services is essential for all. **Purpose of the study:** An audit was conducted to a) explore the ethnicity of adults referred to a burns clinical psychology service compared to those admitted to the affiliated burns service over a five-year period and b) explore associations or differences between ethnicity and indicators of access and engagement with the service. **Methods:** A retrospective analysis of routinely collected data of adults referred to a burns clinical psychology service was conducted over a five-year period. The number of patients referred to the service was explored across different ethnic groups and compared with ethnicities of patients admitted to the affiliated burns service. The number of patients who had psychological assessments, declined/did not attend assessments and psychological therapy sessions received was explored across different ethnic groups. Ethnicity was coded according to descriptors used by the affiliated hospital. For statistical analyses, patients were categorised into two groups: White British patients and patients from ethnic minority groups. **Results:** Over the five-year audit period, 517 patients were referred to the burns clinical psychology service. 63.1% of patients were White British, similar to the proportion admitted to the burns service (63.5%). The proportion of patients from ethnic minority groups (19.3%) was greater than the proportion admitted to the burns service (13.7%). Those referred to the service whose ethnicity was unknown was 17.6%, whereas for those admitted to the burns service it was 22.8%. Pearson's chi square analysis suggested that being from an ethnic minority group and referral to the service was associated. Patients from certain ethnic minority groups seemed to have proportionately fewer assessments, had higher rates of not attending and declining assessments and received psychological therapy less often. However, analyses revealed no statistically significant relationships between White British/ethnic minority group status and not attending or declining assessments and receiving therapy sessions. Although, there was a trend for an association between White British ethnicity and receiving assessments following referral. Analysis revealed no statistically significant difference in the number of psychological therapy sessions received between White British and ethnic minority groups. **Conclusion:** Patients from ethnic minority groups were more likely to be referred to the burns clinical psychology service over the audit period. Patients from ethnic minority groups did not appear to have difficulties accessing or engaging with the burns clinical psychology service, although a trend was revealed which suggested a difficulty accessing assessments. Only a broad level of analysis was possible and ethnicity coding was unknown for a significant proportion of patients. These are problematic for data interpretation and ways to increase routine data collection of ethnicity should be explored

An epidemiological study of elderly burns & development of a regional prehabilitation protocol

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INTRODUCTION

Advances in healthcare and resultant life expectancy are leading to an increasingly elderly population. As a result, burn injuries in this subset are becoming more and more prevalent. This cohort are typically associated with poorer outcomes due to pre-existing medical conditions, frailty, and the potential for more severe burn injuries.

PURPOSE

We performed an epidemiological study to establish the characteristics, management strategies and outcomes in elderly burn patients in our regional burns centre. This will contribute to the development of a prehabilitation protocol to optimise management.

METHODS

We performed a 5-year retrospective case note review for all elderly burn patients admitted to Northern Regional Burns Centre (June 2017 – June 2022) aged over 60 years at the time of admission.

RESULTS

249 elderly patients were admitted to our centre with a burn injury during our study period. Median age was 72 years (65 – 82). Median length of stay was 11 days (4 – 23). Most patients were admitted from home (97%). Median clinical frailty score was 4, meaning patients are considered vulnerable but not fully dependent on care, and a proportion of patients had abnormal cognition (15%) due to dementia or other impairment. The majority of burns were scalds (48%), with flame and contact mechanisms also being prevalent in the cohort (21% and 14% respectively). Most burns injuries were a small percentage TBSA (median TBSA 2.5%) and a total of 13 patients (5%) had significant burn injuries requiring resuscitation. 138 patients (55%) had a burn depth that was either in part or entirely full thickness.

131 (52%) were managed operatively, which entailed either tangential excision and skin grafting (97%), amputation (2%) or both (4%). Median time from admission to surgery was 5 days (2 – 9). Those that were operated on earlier (within 48 hours of admission) were shown to have a shorter hospital stay (median 9 vs 22 days, $p<0.01$). 14 (5%) patients died during admission, and 35 (14%) required discharge to a rehabilitation facility or care placement.

Older patients (≥ 80 years) were significantly more likely to stay in hospital longer (21 days vs 10 days, $p=0.04$), be dependent on care on discharge (42% vs 10%, $p<0.01$) and to die during admission (mortality 11% vs 3%, $p=0.01$) than those in the 60-79 year cohort.

CONCLUSION

This elderly cohort reflect the frailty and fragility to be expected of the growing ageing population. Elderly people will suffer burn injuries that require inpatient care and are typically more challenging to manage. Our results demonstrate these patients have multiple comorbidities, increasing the risk of complications

and outcomes in the elderly are shown to be poorer as a result. Early surgical excision is shown to be beneficial in terms of reducing hospital stay and potentially overall outcome. These results have informed

the development of a regional prehabilitation protocol for elderly burn patients to optimise outcomes in this challenging but ever increasing cohort of patients.

A mixed-methods evaluation of Children's Burns Trust residential family weekends.

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Introduction

Children's Burns Trust is a national charity dedicated to providing rehabilitation support for burned and scald injured children and their families, as well as prevention and awareness campaigns. As part of their ongoing support for children and their families, Children's Burns Trust run three 'family weekends' per year. These are residential events, where children and parents are invited to meet with others who have had similar experiences and learn more about topics relevant to burns care. The delivery of these weekends is in accordance with British Burns Association standards of care which state that "burn-specific support resources are available" (British Burns Association, 2018). During the COVID-19 pandemic, Children's Burns Trust provided online family-events which were found to be highly acceptable. Following the return to face-to-face family weekends in 2022, it was proposed that this support provision be evaluated to better understand the experiences of families and staff, as well as the benefits of attendance for parent and child wellbeing.

Purpose of the study

The aim of this study was to evaluate the experiences of both staff and families attending the Children's Burns Trust family weekends in 2022.

Methods

The evaluation utilised an online questionnaire data collection method. This questionnaire included both qualitative and quantitative components to gather feedback about the family weekends from parents and staff who attended. The quantitative data was analysed using descriptive statistics and the qualitative data was analysed using content analysis.

Results/Discussion

Eleven parents and 23 staff members (e.g., psychological staff, play specialists, nurses, volunteers) completed a post-event questionnaire. Overall, 81% of parents of burn injured children rated their experience of the family weekends as "Very good", whilst 9% rated it as "Good". In addition, 100% of staff members rated their experience of the family weekends as "Very good". Parent feedback on the most important outcomes from attending the family weekend were summarised into the following categories: 1) "Meeting new people and finding community", 2) "Learning about the psychosocial impact of burn injuries and helpful coping strategies", 3) "Learning about treatments and management", and 4) "Increased child confidence". Staff members also provided feedback on the most important outcomes from attending the weekend, which were summarised into the following categories: 1) "Networking with other professionals", 2) "Interacting with families in a non-clinical environment", 3) "Recognising the complexities of family life", and 4) "Opportunity to learn from families".

Conclusion

The findings of this evaluation suggest that the face-to-face Children's Burns Trust family weekends represented a positive and valuable experience for many of the families and staff who attended, with clear benefits of spending an extended period of time together in-person and away from a hospital environment. Both families and staff emphasized the value of shared experiences and meeting others who were at different stages of their recovery after a burn injury. This was felt to be an important element of the weekend.

for both adults and children. Evidence-based recommendations for the planning and evaluation of future family weekends will also be discussed.

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Achieving optimal hydration in adult patients, both in adult burns & ward-based settings, by using The Water Drop

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Hydration is the replacement of lost fluid and is often used in terms of adding water to the human body that has been lost, usually by drinking (Banaszak, 2019).

Bloomfield & Pergram (2012) have said;

“Adequate nutrition and hydration is vital for good health, from both a physical and psychological perspective, and should be considered a priority by nurses. Actions required by nurses may include addressing potential barriers and obstacles that may prevent patients from receiving adequate food and drink.”

One of the major complications associated with severe burns is fluid loss, so replacing lost fluids (fluid resuscitation) is important. The amount of resuscitation fluid needed in the first 24 hours after the burn injury is based on the TBSA and the person's body weight. (NICE, 2016).

There are several formulae to calculate fluid requirements; the most commonly used one in the UK is the Parkland formula, devised at the Parkland Memorial Hospital in the USA (Baker, 2007).

With this method, several calculations are needed to devise a fluid resuscitation protocol, causing potential for error. Inaccuracies in TBSA estimates can have a profound impact on fluid resuscitation outcome, morbidity and mortality (Parvizi, 2014).

As appropriate fluid resuscitation is essential, physiological parameters are also monitored to assess the patient's response and to help avoid complications. Giving too much fluid can give rise to cardiac failure, abdominal compartment syndrome, acute respiratory distress syndrome, increased risk of infectious complications, and even death. Giving too little fluid can lead to systemic inflammatory response syndrome, hypovolaemic shock and organ failure (Luo, 2015).

As an alternative to IV fluid resuscitation, the use of oral rehydration solution therapy (ORST) has been used and found to be very beneficial in the resuscitation of children with moderate burns (Milner, 2012). ORST has a number of advantages over IV therapies, including; ease of administration, compactness, modularity (doesn't require accessory intravenous equipment), physiological non-invasiveness with little risk of infection since dermal penetration isn't required and its low cost, resulting in a viable alternative to IV fluid resuscitation in burns care (Vyas, 2013).

Are there alternative ways to fluid resuscitate burns patients?

The Water Drop is a low-cost, high-impact innovative drinking system, specifically designed for hospital patients, and is suitable for orally resuscitating burns patients (non-ventilated) with a large TBSA.

Hydrate For Health (2022) has described The Water Drop as; “an intravenous drip system that is used orally”.

The Water Drop is a simple, low-cost, single-patient use, disposable product that fits the way the NHS work at an operational level (Hydrate for Health, 2022).

The Water Drop is very easy to use.

Once filled with fluids it is designed to be easily attached, (by using the hang point, metal hook or Velcro strap) to a wide range of things which make it easy to access – such as a drip stand, bed rail, etc. The user then simply bites the non-return valve at the end of the tube to release fluids in an easy to control flow (Hydrate For Health, 2022).

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Burns Care Information Padlet

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Padlet is an educational technology startup company providing a cloud-based software-as-a-service, hosting a real-time collaborative web platform in which users can upload, organise, and share content to virtual bulletin boards called "padlets".

The space can be accessed by nearly any device.

This platform is a helpful aid with both teaching and learning virtually, allowing for remote access to burns care education worldwide.

I have created a burns care information padlet that is a helpful platform for healthcare professionals to easily & simply access burns care advice, management & information at a glance.

My padlet can be accessed via a QR code access or via website address link (please see below).

<https://padlet.com/mamieoreilly/burns-care-information-padlet-r90vpvjr73lz323s>

The use of laser doppler imaging (LDI) in nitric acid burns: A case report and literature review.

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Introduction

Nitric acid burns are relatively uncommon and not extensively reported in medical literature, hence there are no formal guidelines for the management of these injuries. Burn depth assessment is an essential step of burn care, influencing subsequent treatment choices and thus patient outcomes.

Purpose of the study

Laser Doppler Imaging (LDI) technology has been validated to assess thermal burn depth, with >90% accuracy in predicting wound healing potential. However, there is no clear evidence for its use in chemical burns. We present our experience with the use of LDI in the assessment of a nitric acid burn and a literature review.

Methods

We present a case of an 8% TBSA nitric acid burn following an industrial accident, in an otherwise healthy 36-year-old man. A comprehensive literature review was performed using the MEDLINE (PubMed) database to identify animal or clinical studies evaluating the efficacy of LDI in chemical burns. A qualitative synthesis of our findings is presented.

Results

On initial review of the patient, LDI assessment was suggestive poor healing potential of >21 days, warranting surgical management. However, conservative management was opted for based on clinical assessment as the eschar over the wound appeared to be thin and consistent with staining of the epithelium. This was clinically suggestive of a more superficial burn, rather than true eschar of a deep burn. Patient follow-up confirmed a total burn healing time of two months, suggesting that the LDI assessment was accurate. The literature search of LDI use in chemical burns corroborated these findings. We identified two experimental studies in porcine models with sulphur mustard burns, each confirming the accuracy of a LDI assessment when compared to the histopathology findings.

Conclusion

Limited experimental animal studies on the use of LDI suggest similar validity in chemical burns, and this correlates with the clinical outcome in this case. However this alone is insufficient to prove the validity of LDI and define its role in the assessment of chemical burns. Clinical trials are required to further assess and define the parameters of its use and efficacy in this context.

The Use of Virtual Reality (VR) to Manage Pain, Fear & Anxiety in Burn Care

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Introduction:

Burns dressing changes can be traumatic and painful which can lead to high levels of stress, anxiety; and discomfort resulting in non-compliance, which may affect the healing process. This needs to be taken into consideration as most patients may require more than one dressing change with oral analgesia +/- sedation or undergoing a general anaesthesia (GA).

Virtual reality (VR) is a fully digital, computer-generated, three-dimensional experiential environment. It allows the user to step inside an experience, to be immersed in and interact with a 3D world that can either simulate or differ completely from the real world.

Purpose:

- Technology is changing for better, and so is the need of distraction for medical interventions that promote pain.
- Using a VR headset will enable a group of patients to become immersed in the technology that will increase demands upon attention and reduce cues to pain and anxiety before and during procedures and thus reducing the need of GA

Method:

- Patients (8 years +) that were undergoing a change of dressing (COD) were approached prior to their COD to ask if they would like to try to use the VR for distraction during the COD. If agreed, they had to be prepared for the use of the VR.
- The preparation session enabled the Health Care Play Specialist (HPS) to assess if this was an appropriate type of distraction for the individual patient and the patient/family to consent the use of VR for the intervention. Before the dressing commenced, most patients had oral analgesia and then distracted with the use of VR. On further change of dressings, the oral analgesia was reduced and further support for distraction was provided with the use of the VR.
- Feedback was collected from patient, parent/carer and MDT post the dressing changes through feedback forms.

Results/Discussion:

- A total of 15 patients participated within a 3-month VR trial period and 2 patients had used the VR for play purpose prior to the accident.
- Post their initial change of dressings (COD) the need and amount of analgesia decreased or was not needed.
- 1 patient did not engage due to the high level of anxiety thereby needing a GA.

Conclusion/recommendations:

- In this trial, patient anxiety decreased in the journey of their COD and being fully immersed in the VR supported this experience. Overall, this transformed negative patient experience to a positive experience and improved patient compliance, engagement and prepared for future COD's.
- The Trust have recently begun a pilot study in introducing the use of VR as a form of distraction

Free tissue reconstruction of a liquid nitrogen burn: a case report and literature review

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Due to its boiling point of -196°C , liquid nitrogen is a cryogenic substance which is commonly used in many industries for its cooling properties. However, this extreme cooling capability means it also has the potential to inflict severe full-thickness burns. Despite its widespread use in the workplace, very little has been described in the literature regarding complex reconstruction of liquid nitrogen burns. We present a case that is unique, not only in its unusual mechanism of injury, but also in that it is the first described case of free tissue reconstruction of cryogenic burns.

Case Series and Scoping Review Evaluating the Use of Spincare for the Management of Paediatric Burns

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Case Series and Scoping Review Evaluating the Use of Spincare for the Management of Paediatric Burns
Introduction: Burn dressings remain an area of innovation, especially in paediatrics. Understanding the challenges faced with pain management, dressing application and the logistics of dressing changes are crucial. The Spincare wound system is an electrospun nanofibrous polymer dressing, promising innovation in its application, healing, pain control and scarring with improved healing times.

Purpose of the study: Our prospective study reports on our experience with SpincareTM at a paediatric burns centre. We have outlined current evidence and reported outcomes for the use of SpincareTM in a comprehensive scoping review.

Methods: Trials on “Spincare” and “Electrospun Nanofiber Matrix” were retrieved from Ovid Medline, Google Scholar, and Scopus. Publications were reviewed in English up to January 2023. Trials involving Spincare for purposes other than burns treatment were excluded.

We evaluated patients treated with Spincare (7 patients) in our unit from January 2022 to September 2022. These patients were compared retrospectively to a non-Spincare group (7 patients) with similar demographics and injuries. Data was prospectively collected including mechanism and time, primary assessment, procedures, dressings, intra-operative findings, adherence rate, laser doppler measurements, pain and itching scores, analgesia requirements, and complications. Patients were followed up for three months, assessing their wound healing and short-term scar management.

Results: We treated 7 patients with Spincare with the average treatment age being 3.2 years. The average burn size was a total body surface area of 7.1%. There was no significant difference in healing time for the Spincare group. There were no significant differences found in pain or itching scores at burns assessment

after the first application. Hospital admission for Spincare vs. non- Spincare patients was reduced by nearly 48 hours (excluding grafts). In 3 out of 7 patients, skin grafting was required to treat full-thickness burn areas, with a full-thickness TBSA averaging 2.3%. Only 1 patient needed further dressing changes in theatre after the initial Spincare application. Differences in intra-operative heart rate after application were not significant. No significant complications were found. Hypertrophic scarring in grafted patients required longer-term scar management, thus not involving Spincare treated areas.

Conclusion: Spincare was found to be a safe alternative for managing paediatric partial thickness burns. In our experience, Spincare can be proposed as a practical alternative to traditional dressings, but additional supportive dressings are often still utilised as adjuncts. This may reduce cost-effectiveness in the short term. We experienced no significant reduction in healing time, however, observed easiness with subsequent dressings changes, and management of challenging areas like neck and face. Patients appeared to remain comfortable after Spincare application, and we believe this had benefits for both physiotherapy and return to normal play.

Limitations to use included the availability of trained professionals for application and the supply of SpincareTM, as it is not currently routinely supplied to our unit. Theatre availability and bed space were not affected by SpincareTM application. Our preliminary observations we believe demonstrate that SpincareTM has a role to play in the treatment of paediatric burns, however larger comparative studies are required to accurately determine Spincare's role in our armamentarium

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Synthesis of MCM-41@SO₃H-Polymixin B Nanocomposite for Extraction and Determination of Lipopolysaccharide from Aqueous Solutions using Taguchi Fractional Factorial Design

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Introduction: Lipopolysaccharide (LPS) is a component of Gram-negative bacteria 's outer membrane that, when released into aqueous solutions, can have devastating consequences for human health.

Aim: In this study, sulfonic acid-functionalized mesoporous silica nanocomposites bound to polymixin-B were synthesized, and their functionality to absorb the bacterial LPS from human serum was investigated.

Method: Briefly, *Pseudomonas aeruginosa* was isolated from burn wounds, and its LPS was extracted. Then, Mesoporous MCM-41 nanocomposites were fabricated and functionalized with the sulfonic acid groups. Finally, nanocomposites were used to extract LPS from human serum, and statistical data were analyzed using the Taguchi method.

Results: Extraction of bacterial LPS with a modified method, optimization of factors affecting the extraction of endotoxin using the Taguchi method, introduction of new nano-composites with nanometer pores, and obtaining results with 96% effectiveness in removing LPS in LAL and MTT tests were the most important findings. The obtained calibration curve was linear in the ranges of 1–300 µg L⁻¹ with reasonable linearity ($r^2 > 0.998$). The limit of detection (LOD) based on S/N=3 was 0.03 µg L⁻¹ for 10 mL sample volumes.

Conclusion: New mesoporous nanocomposites with extremely high contact surfaces were developed particularly for LPS in this work, resulting in a new, fast, and effective approach for detecting and removing endotoxin from aqueous solutions. First, during a process called "Extraction", the adsorption capacity of LPS by nanoparticles was evaluated using a special statistical method called Taguchi. Then, to optimize the process, we designed 16 random tests based on various factors and analyzed the answers using analysis of variance. The optimal test conditions were determined and the test was performed again under optimal conditions. The adsorption values of MCM-41@SO₃H Polymixin B nanocomposites were consistent with the expected optimal response, which indicated the accuracy of the experiments. Two other experiments, LAL and MTT were then designed to determine the performance of the above nanoparticles. It was observed that according to the LAL test, nanoparticles were successful in absorbing up to 96% of purified LPS. In MTT test, the nanocomposites up to 86% (when using purified LPS) and up to 91% (when using standard LPS) resulted in the survival of liver cells compared to the control group, which confirmed the accuracy of nano adsorbents function. Because relatively minimal quantities of adsorbent were used in this process, it is considered an environmentally beneficial procedure. The extraction method utilized is also a low-cost, easy-to-use, and reliable technology. Other advantages of this research over similar samples include the design of multiple trials and the application of a novel analytical approach to optimize the extraction procedure.

Are hot water bottle burn injuries on the rise? A single burn unit's experience.

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(a) Introduction

Hot water bottles (HWB) are great for providing warmth, pain relief, and comfort; however the public may not be aware of the dangers of using a HWB incorrectly. Working on the children's burns unit at Pinderfields hospital, anecdotally we noticed an increase in the incidence of HWB burn injuries we were seeing referred via MDSAS. We also noticed an increase in the referrals seen by the Adult Burns Centre.

HWB burn injuries have also been recently been covered in the press, trying to raise awareness of the dangers of using them incorrectly. We have had experience in caring for patients with HWB burn injuries that have either been scalds or contact burns. Patients have filled hot water bottles with boiling water from kettles and used hot water bottles that were past their expiry date or were in poor condition.

(b) Purpose of the study

To review how many HWB related burn injuries we have treated in the last 3 years, to see if there has been an increase, decrease or remained the same.

(c) Method

A search of the international burns injury database (IBID) was carried out to ascertain the number of paediatric and adult patients we treated who had sustained scalds or contact burns caused by a HWB in the years 2020, 2021 and 2022 and compared the data.

(d) Results/Discussion

Paediatric HWB burn injuries - 2020 – 10 patients (9 scalds, 1 contact). 2021 – 12 patients (11 scalds, 1 contact). 2022 – 10 patients (8 scalds, 2 contact).

Adult HWB burn injuries - 2020 – 31 patients (20 scalds, 11 contact). 2021 – 33 patients (22 scalds, 11 contact). 2022 – 27 patients (23 scalds, 4 contact).

Paediatric patients saw an increase of 20% in the incidence of HWB related burn injuries treated at our unit between 2020 and 2021, followed by a 16% decrease between 2021 and 2022.

Adult patients saw an increase of 6.5% in the incidence of HWB related burn injuries treated by our burns centre between 2020 and 2021, followed by an 18% decrease between 2022 and 2023. (However the final patient numbers for 2022 may be higher once all the data is input on IBID).

We will continue to audit this, to see if there will be an increase in 2023.

(e) Conclusion

The incidence of hot water bottle injuries treated at our paediatric burns unit and adult burns centre has fluctuated very slightly over the last 3 years

However with the current economic situation, we may begin to see an increase in the number of HWB burn injuries. Recent press, including on social media may help in raising awareness of the dangers of hot water bottles, and prevent these injuries from occurring. We will continue to audit these injuries to identify possible targets for prevention, due to their increased use as a direct effect of the increase in energy prices and cost of living crisis.

The cost of keeping warm: The impact of the domestic energy crisis on referrals to a tertiary burns centre.

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INTRODUCTION

The UK is in the midst of a domestic energy crisis, with the average domestic gas and electricity bill rising by 75% between 2019 and 2022. This is despite the winter of 2022 being unseasonably warm. Those in the lowest socioeconomic group are the hardest hit, with 8.4% of total weekly expenditure being spent on fuel, compared to 3.4% by the most wealthy. As people feel the squeeze, more may find themselves turning to other means to keep warm in the home, such as hot water bottles, radiant heaters, and electric blankets. However, an unintended consequence of these efforts may be an increase in burn injuries caused by misfortune, misuse, or the use of items in a state of disrepair.

PURPOSE

The aim of this study was to explore any increase in referrals to a single burns centre in England for injuries caused by hot water bottles, radiant heaters, or electric blankets.

METHODS

This was a retrospective study of a prospectively maintained database of referrals through the MDSAS system. All referrals between January 16th 2022 and January 16th 2023 were selected and compared with the same period from 2020-2021 (before the rise in energy prices). Referrals were screened for the terms “hot water bottle,” “electric heater,” “electric blanket,” and “heater.” Total referrals in each period, demographic data (age, gender), anatomical location and the mechanism of injury were compared between cohorts.

RESULTS

There was a statistically significant increase in the number of burns relating to heating implements between 2020/21 and 2022/23, rising from 54 to 81 ($p = 0.03$) – a 50% increase in injuries. The majority of those with injuries were female (69%). Injuries in working age adults increased significantly (52% to 69%, $p < 0.05$), with the relative number of children injured decreasing (22% to 18%, $p = 0.50$), as well as a decrease in injuries in the over 65's (26% to 14%, $p = 0.08$). The most frequently injured area was the leg (30%) followed by the hand (18%). The commonest type of injury described was scald (72%).

CONCLUSION

There has been a significant increase in the number of injuries sustained by people using personal heating equipment, which correlates with the rise in domestic energy prices. With prices expected to rise further, and a general increase in the cost of living as a whole, centres should expect to see a continued increase in this type of injury. The most affected demographic appears to be working age adults, with wider implications around lost work-time yet to be explored.

Evaluation of the effect of topical potassium permanganate 5% solution on diabetic foot ulcers: a randomized controlled clinical trial

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Introduction: Diabetic foot ulcer is an important complication of diabetes. Despite various treatment methods for these ulcers, many of these ulcers do not heal, leading to morbidity and mortality in diabetic patients.

Aim: This study aimed to evaluate the effect of topical potassium permanganate 5% on diabetic foot ulcers.

Method: This clinical trial study was conducted on patients with diabetic foot ulcers with Wegener grade I and II. The sample size was 23 patients. The control group (n=11) was treated with the current standard treatment for diabetic foot ulcers, and the intervention group (n=12) received the standard treatment plus 5% topical potassium permanganate solution. Local infection; degree and size of the wound; the edges of the wound and granulation formation; duration of complete wound healing were assessed.

Results: In this study, 23 patients were examined, of which 7 (30.4%) were male, and 16 (69.6%) were female. The average age of the patients under investigation was about 59 years, with a standard deviation of about four years. In both intervention and control groups, the average wound size and local infection in the follow-up sessions of the patients had a decreasing trend, which was statistically significant ($p < 0.0001$). However, at all measurement times, the average size of the ulcers and the ratio of local ulcer infection in the intervention group patients were lower than in the control group ($p < 0.050$). On the 21st day, out of 12 patients in the intervention group, the ulcer of 4 people were completely healed. However, no cases of complete healing of the ulcers were observed in the control group.

Conclusion: This study showed that potassium permanganate is well tolerated as a complementary treatment for diabetic foot ulcers. Moreover, it is effective in improving infection and speeding up wound healing. These results suggest that topical potassium permanganate can be used as a complementary treatment for diabetic foot ulcers.

Patient or Prisoner? - Acute Burn Injuries in Prisoners: The Experience of a Regional Burns Centre

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Introduction

Due to an increased risk of violence and self-harm, prisoners are a vulnerable population with complex health needs. Although they account for a small proportion of patients with burn injuries, they present a unique set of challenges.

Purpose of the study

This study investigates the incidence, pattern and outcomes of burn injuries in the prison population.

Methods

Prisoners referred to a regional burns centre from 2010 to 2021 were identified from the International Burn Injury Database (iBID) database. Data on patient demographics, burn injury characteristics and outcomes were collected. Patients were then stratified based on the mechanism of burn injury, treatment modality (surgery vs conservative), hospital admission (inpatient vs outpatient) and compliance with outpatient follow-up, for subgroup analyses.

Results

Sixty eight prisoners sustained a burn during the study period, with a mean age of 29.9 years and mean total body surface area (TBSA) of 5.8%. The majority were male (98.5%) and required hospital admission (75%), with most presenting to hospital on the same day as the initial injury (79.4%). The rate of infection amongst prisoners presenting late was significantly greater than those who sought medical attention in a timely fashion (57.1% vs 1.9%, $p < 0.01$ respectively). Scalds were the most common type of injury (77.9%) and assault the most frequent cause of burns (63.2%). Eighteen patients (26.5%) underwent a surgical procedure and there were two inpatient mortalities. The mean length of stay was 4.9 days (range 1-16). Of the patients for whom follow-up was planned, 22% did not attend any appointments, with a further 49% of prisoners missing at least one appointment. Scalds were more common in inflicted injuries (assault or deliberate self-harm) relative to accidental injuries ($p < 0.001$). Cases of assault rarely required surgery ($p = 0.044$) and the greatest mean TBSA was observed in the self-harm cohort ($p = 0.031$). Relative to patients managed non-operatively, prisoners undergoing surgery had a larger TBSA, longer length of stay and all attended outpatient follow-up appointments. Patients who attended follow-up had a longer mean length of stay when compared to those who did not attend appointments.

Conclusions

Prisoners represent a unique population with exceptional challenges. Attention should be given to protecting vulnerable patients at risk of assault, education of prison staff around burn prevention and first aid, and ensuring that prisoners are able to access burns follow-up to minimise long term sequelae. Opportunities exist to aid this such as the adoption of telemedicine.

Contact thermal burns secondary to microwave heating of drinkware – an emerging problem in the UK?

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Introduction:

Microwave heating of ceramic drinkware is a potential cause of thermal contact burns. We noted empirically a recent increase in the number of presentations of contact burns secondary to microwave heating of drinkware. We also noted a trend to these injuries being related to metallic coated cups.

Purpose of the study:

To identify the incidence and recent local and national trends of contact burns secondary to microwave heating of drinkware overall and specifically due to heating of drinkware with metallic coatings.

Methods:

We performed a retrospective analysis of prospectively collected data of patients with contact burns from microwave-heated drinkware. National data on all patients treated in UK Burn services for such injuries between November 2018 and December 2022 was obtained from the UK iBID (International Burn Injury Database). Patients treated within our adult Burn service for the same mechanism and over the same time period had their electronic patient records (EPR) reviewed. Data was collected on patient demographics, injury details, healing time, time to return to work and follow-up duration.

Results/Discussion:

National Data: 231 patients sustained contact burns from hot ceramic drinkware in the UK over the study period. Of this cohort, 89 patients were identified as sustaining their injuries after microwaving drinkware and the remaining 223 patients did not have the source of heating recorded within iBID. Within the microwave subgroup, 91% were adults (n=81) and 85% (n=76) were women. Injury location was the patient's own home in 83%, median (IQR) burn size was 0.1% (0.1-0.2%) TBSA (total body surface area). Burn depth was mostly superficial dermal (92%) (SD), the remainder were deep dermal (DD) (8%). All burns were managed non-operatively, and no complications were reported.

Regional Data: We identified 51 patients with contact burns from microwave heated drinkware. Of this group, 59% (n=30) were caused by contact with cups with metallic coatings. Mean age for the whole cohort was 40 years (+/- 16), female:male ratio was 43:8, median TBSA was 0.1% (0.1-0.1%) and 76% of injuries affected the right hand. The majority of burns were assessed as superficial dermal (88%) with 12% being deep dermal. The majority (83%) of the deeper burns were caused by cups with metallic coatings. The median (IQR) length of outpatient follow-up within the burns service was 1 day (1-2). Median (IQR) healing time was 14 days (14-14) and mean time to return to work was 7.6 (+/-3.5) days. No patients required surgical treatment.

Conclusions:

Microwave heating of ceramic drinkware results in a small proportion of burn injuries presenting to Burn services in the UK but the true incidence is likely to be larger. Owing to the typically small burn size to

hands, many injuries may not be referred onto Burn services. These injuries, despite rarely requiring surgical intervention, do result in time off work and need for dressings. Our local data highlighted that metallic coated drinkware appears to be causative in a high proportion of these injuries. We plan to work with drinkware manufacturers to improve safety information supplied with such products.

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Reconstruction of Pediatric Post High Voltage Electric Burn Scalp Defects with the Orticochea Flap

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¹BURN CARE CENTRE PIMS

Purpose of study: Exposed burn wounds on scalp in pediatric age group are a challenge for reconstruction. We planned Orticochea flap technique for coverage of exposed bone on scalp.

Materials and methods: The case series was followed from January 2022 to October 2022. Inclusion criteria included open scalp wounds post High Voltage Electric Burns (HVEB). A total of 5 patients with open scalp wounds reported to Burn Care Centre (BCC) were included. All patients included have Scalp wound greater than 25 cm².

Results: Children with post-HVEB scalp defects were selected for use of the Orticochea flap technique for reconstruction at the Burn care & reconstructive centre. The ages ranged from 7 to 12 years and defects ranged from 4.5 x 9 to 6.5 x 11 cm. Four of these underwent three flaps technique while one of these undergoes four flap technique. All these were secondary to HVEB (1000 V) with 6th degree. All these children got satisfactory results on follow-up visits.

Conclusion: Orticochea flap is an appropriate option for scalp reconstruction in High voltage electric burn with exposed bone on scalp. It preserves hair line and provides better cosmetic results.

Comparison of Dexlansoprazole with omeprazole as anti-proton imhibitor in acute burn patients.

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Introduction: curling ulcers are a common occurrence in severe burn patients. The acute partial thickness to deep dermal patients, who are treated on out-patient basis, develop dyspepsia and stomach pain. Common etiologies of this pain is due to the amount of painkillers taken and lack of compliance with the anti-proton inhibitors.

Materials and method: a cross-sectional study was designed to see the affects and compliance of burn patients with the anti-proton inhibitors. The study was conducted during a period of 3 months from December 2021 to February 2022. 5-10% partial thickness to deep dermal burn patients were included in this study who were treated on out-patient basis. All these patients were more than 18 years of age with no previous comorbid or previous medicine usage. . A sample size of 100 patients was taken, these patients were divided into two groups of 50. The patients were given full dose of dexlansoprazole 60mg in morning in group A and omeprazole 40 mg at night in group B Both these groups were given the same analgesics which was oral ibuprofen. A questionnaire was filled at the completion of treatment , which was taken to be discontinuation of analgesics one week after the dressings were stopped.

Results: the sample included 65 males and 35 females. The dexlansoprazole group had 80% compliance as compared to 65% in the omeprazole group. There was 15% incidence of abdominal pain as compared to 25% group B. Post medicine nausea was 10% as compared to omeprazole 20%, vomiting 15% in both groups, lack of taste 5% as compared to 10% group B, numbness 5% only in group A. no tachycardia or difficult breathing was seen in either group. Overall compliance was 90% in group A as compared to 75% in group B. Decreased compliance of omeprazole was attributed to price and side-effects. Overall the satisfaction was 15% times higher for dexlansoprazole.

Conclusion: prevention of dyspepsia should be the goal in any post burn patient. The compliance was best seen in dexlansoprazole group. Further studies are needed to increase our knowledge on this subject.

Major thermal injury is associated with evidence of long-term epigenetic remodelling and accelerated biological ageing

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Introduction

Following burn injury, individuals are at an increased risk of mortality and morbidity. We therefore hypothesised that burn injury may be causing epigenetic changes which persist long-term, as well as accelerating rate of biological ageing.

Purpose

To establish the long-term impact of burn injury on the methylome and biological ageing.

Methods

DNA was isolated from the PBMC's of both burn injured patients 6 months post injury (n = 34) and non-injured individuals (n = 31). Isolated DNA was analysed using Illumina DNA methylation arrays. The differentially methylated genes and pathways between the groups were established and epigenetic age acceleration was calculated using epigenetic clocks.

Results

There were several significantly differentially methylated genes and pathways between the healthy and burn injured groups 6 months post injury (Adjusted p value = <0.01). These pathways included but were not limited to "Extracellular matrix organisation", "Diseases of signal transduction by growth factor receptors and second messengers" and "intracellular signalling by second messengers". There was also a significant increase in epigenetic age of +6 years (p = 5.2e-0.8) 6 months post burn injury, according to the Horvath epigenetic clock, with no significant difference detected using the Hannum clock (p = 0.1).

Conclusions

Burn injury is associated with long-term epigenetic reprogramming, as well as changes to the biological ageing trajectory which may play a role in the poor health outcomes often observed in burn injured individuals.

A review of minor burn injury management by community pharmacies in South East England

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Introduction:

Patients with minor burn injuries may self-present or be referred to their local pharmacy for treatment. This is part of an NHS initiative to reduce pressure on primary care and emergency departments. Specialist burns services usually have little interaction with community pharmacies. Consequently, awareness of the management of this patient cohort is limited.

Purpose:

We aimed to ascertain the level of knowledge and confidence possessed by community pharmacists in South East England regarding the care of minor burns, and the scope of their input.

Methods:

An online questionnaire was distributed electronically to all community pharmacies in Kent, Surrey and Sussex. The questions were themed to focus on service utilisation, management protocols and staff capabilities.

Results:

Of the pharmacists surveyed, very few had any formal burns training and none kept a record of the patients that they had treated. There was no universal management protocol in use. A large proportion of pharmacists felt that they had poor overall knowledge of burns management; the majority would be interested in further training and the development of formal guidance.

Conclusions:

Pharmacists encounter minor burn injuries in the community, yet have a generally inadequate understanding of their management. The paucity of education and guidance may result in variation in the quality of care provided, and the absence of documentation results in a lack of patient traceability. There was a desire amongst responders for further training and resources, which could aid regulation of services, deliver better patient care and offload some of the burden on primary, emergency and tertiary services.

Xanthan gum hydrogel improves wound healing in a rat model of excision injury

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Purpose: Skin wounds are a significant public health issue due to the lack of real effective remedies. Hydrogel dressings are used for wounds with low and medium secretions due to swelling due to the absorption of wound secretions because they may moisten the surrounding tissues due to their inability to absorb a large volume of secretions. On the other hand, the use of xanthan gum does not stick to the wound.

Materials and Methods: In this work, a novel hydrogel based on xanthan Gum was prepared as a wound dressing and examined in a rat excisional wound model. This Hydrogel is prepared by free radical polymerization using potassium persulfate (KPS) as an initiator, N, N-methylene bisacrylamide (MBA) as a crosslinker, and poly acrylic acid (PAA) as a monomer in the presence of Xanthan gum. Analyses such as SEM, FT-IR, XRD, and TGA were used to study morphology structure. After choosing the optimal sample, the swelling and release test and animal studies were done. The results showed that the acrylic acid monomer had higher swelling and controlled release. Finally, the wound-healing efficacy of the xanthan gum was evaluated in an excision wound model in rats. this research done on 30 rats, The excision in rat models were made by punching and removed full thickness skin on the back. All the rats were randomly divided into 3 groups: control group (n = 10), treatment group (n = 10), and sham group (n = 10). Tissue examination was done on days 0, 7 and 21. The healing rates were calculated and compared among the groups and the tissues of the wound were taken and evaluated for histological analysis by H&E hematoxylin and eosin masson's trichrome staining.

Results: The in vitro results exhibited that the acrylic acid monomer had higher swelling and controlled release. The prepared hydrogels had biocompatibility, acceptable mechanical properties, sustained release, capacity to absorb wound exudate, and non-toxicity of Hydrogel. In vivo, the Hydrogel effectively accelerated wound contraction and promoted wound healing compared to controls.

Conclusion: in conclusion, Although further investigations, including preclinical and clinical studies, are required, our findings strongly suggest that Hydrogel might be considered a potential novel wound dressing for the healing of various wounds.

Keywords: wound dressing, Xanthan gum, poly acrylic acid, Hydrogel

Development of a burns dressing pathway to improve healing time for paediatric patients

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(a) Introduction

A burns specialist needs to consider a wide variety of influencing factors when assessing and dressing a wound. Burns and paediatrics are both speciality areas, so treating a paediatric patient with a burn requires experienced and professional care. Historically, clinicians have used multiple wound dressings to achieve optimal healing for burns. The pathway includes the use of dressings that can manage the local wound condition, prevent infection and prevent both trauma and pain during dressing changes. All these considerations are highly desirable when treating children.

(b) Purpose of the study

Following a move for paediatric patients at Salisbury NHS Foundation Trust from being treated on a burns unit to a paediatric ward, the need for simplified dressings guidance was identified to help with the transition and training. The aim of this project was to develop specific pathways in children for the three burn depths: Superficial partial, deep partial and full thickness.

(c) Methods

As there were established pathways for both superficial partial and full thickness, the study focused on deep partial wounds. The trial of a new silver dressing (UrgoClean Ag, Urgo Limited, Loughborough, UK) in 2019 allowed us to conduct several case studies for this purpose.

(d) Results/Discussion

Case study 1: An 18-month-old girl presented with a deep partial scald (immersed in bowl of boiling water) to the right hand. UrgoClean Ag dressing was left in place for 4 days and the wound had achieved 100% epithelialisation,

Case study 2: a 2.5-year-old boy presented with a 3-day-old full thickness wound to the cubital fossa of the right arm that measured approximately 6 x 4.5 cm. UrgoClean Ag was applied and left in place for 7 days. This duration was not possible with previous dressing regimes. At day 10, the wound area was much reduced and measured 1.5cm x 1cm, as seen in image 4. The patient experienced a pain free and atraumatic dressing removal.

Case study 3: A 7-year-old girl presented with a 2-day old deep partial scald from a hot drink. UrgoClean Ag was applied and left in situ until day 7, by which time the scald was 100% epithelialized as seen. Pain-free dressing removal was experienced by the patient.

The UrgoClean Ag dressing has now been used on more than 250 paediatric patients over 3 years. For deep partial or full thickness burns, an average healing time of 2 weeks has been achieved, which results in reduced requirement for skin grafting. The clinicians feel confident using the dressings on children with burn injuries and leaving it in place for up to 7 days. This not only provides a less traumatic experience for the children with burns and their carers but potentially improved cosmetic results through reduced scarring. An economic saving through reduced clinician time and surgical invention can also be achieved.

(e) Conclusion

A detailed burns pathway flow diagram will be presented.

Quantifying the clinical and economic burden of desquamating dermatological conditions in a supraregional burns centre

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Introduction: As with burn injuries, diseases in which the skin is disrupted present a series of physiological, antimicrobial and psychological challenges.

Purpose of study: In the context of a number of recent cases in our burns centre, we sought to identify the spectrum of desquamating skin diseases that are referred for tertiary burns care, quantify the care requirements these patients exert on the burns service and estimate the associated costs of managing their care.

Methods: Patient records were identified in which patients had been admitted under burns with non-burn induced skin loss between 2016 and 2022. Data was extracted from inpatient records, operative notes, dressing clinic records. A cost analysis was conducted using figures extracted from the National Schedule of National Health Service Costs and from figures previously published from our unit, corrected for inflation.

Results/Discussion: 20 patients were identified, with a mean of 2.9 cases referred per year. The median age was 46.5 and median TBSA was 30%. The mean length of stay was 21.2 days (range 2-53), with 8/20 patients requiring intensive care. Overall mortality was 30%, rising to 50% if patients required ITU admission.

Patients had a mean of 1.5 operations under general anaesthesia with a mean operative time of 168.7 minutes per patient. Post-operatively, a mean of 8.3 dressing changes were performed per patient (range 1-21). 75% of patients were referred with an initial diagnosis of toxic epidermal necrolysis syndrome (TENS). Following histopathological diagnosis, only 32% of patients had TENS (32%), with linear IgA disease, pemphigus vulgaris, pemphigus paraneoplastica and bullous lupus comprising the other histological diagnoses. This emphasises the importance of attaining a tissue diagnosis to facilitate directed medical management of these patients. A cost analysis predicted £146,691 attributable to ward based care, £687,046.80 attributable to ITU care, £432,306.48 attributable to theatre time and £21,951.36 to dressing changes, with a total cost to the unit of £1,287,996.

Conclusion: Desquamating dermatological diseases are life-threatening conditions with exhaustive care requirements. Our experiences highlight the importance of awareness of the range of desquamating skin conditions beyond TENS to enable optimum management, and the need to ensure adequate financial provisions to accommodate the care requirements mandated by these patients.

A 15 year epidemiological study of paediatric burns at the Welsh Centre for Burns and Plastic Surgery and the impact of COVID-19

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Introduction

Burns are a significant cause of morbidity and mortality in children, with children accounting for 50% of all burns in the hospital setting. Many of these are preventable, yet the number of referrals and admissions appear to be on the increase.

Purpose of study

To provide a demographic analysis of paediatric burns in Wales over the last 15 years and investigate the effect of COVID-19 on the causation and frequency of safeguarding referrals.

Methods

Routinely collected data from the International Burn Injury Database was extracted between 2005 and 2020 in Wales. Data pertaining to number of annual admissions, age, TBSA, length of stay and causation were analysed. To investigate the effect of COVID-19, admissions were retrospectively scrutinised for one year pre-COVID (2019) and during COVID (2020). These two time periods were compared for the number, nature and TBSA of the burn injuries seen and for the number of safeguarding referrals made during this period.

Results/discussion

The number of burn injuries referred demonstrated fluctuance annually ranging from 270 to 446 per year. The number of burns patients admitted for burns care has fallen since 2005, from 172 per year to 32 per year in 2020. This is mirrored in the mean TBSA from 2-3% to 1-2% since the paediatric burns unit status was acquired in 2010. The most common cause of burn was scald, followed by contact burns, of which the frequency has risen in proportion to scalds since 2015. During the course of the COVID pandemic, the number of paediatric burns referrals fell by up to 50% per month compared to the year prior to lockdown. The number of safeguarding referrals fell from 24% to 16% during the pandemic, with a mean safeguarding score of 2 compared to 3 pre-pandemic, despite a higher mean TBSA in the lockdown period (1.76%, compared to 1.06 pre-lockdown).

Conclusion

A general decline in the number of paediatric burn referrals has been noted over the past 15 years with a reduction in the mean TBSA and duration of hospital stay. This is in part owing to better burns education, awareness and improvements in community led burns care. The COVID pandemic did not appear to significantly increase concerns regarding safeguarding in paediatric burns.

Biodegradable Temporising Matrix as an adjunct in periarticular and extremity reconstruction: Experience and Recommendations from a Supraregional Burns Centre

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Introduction: Addressing joint contractures secondary to split thickness skin grafts are a major challenge in burns and reconstructive surgery.

Purpose of study: We aimed to identify the efficacy of biodegradable temporising matrix (BTM) in the context of limb wound resurfacing, and to propose recommendations for maximising post-operative function.

Methods: Clinical records were searched retrospectively between July 2020 and September 2021 to identify patients in which BTM has been used to resurface full thickness defects. Multidisciplinary notes were examined to detect complications, to determine the time until grafting and post-operative range of movement.

Results/Discussion: 12 patients underwent reconstruction with BTM of which 5 (42%) were full thickness burn injuries, 2 (17%) were donor sites, 2 (17%) were to facilitate contracture release, 2 (17%) were for necrotising fasciitis reconstruction and 1 for a degloving injury (8%). 9 of the 12 patients (75%) had concomitant vacuum assisted closure. The first change of dressing was on average 5 days post-op (range 2-8) with mobilisation encouraged after 24 hours in most patients (58%). A mean period of 39.7 days elapsed between application of BTM to grafting with a split thickness skin graft. 5/12 patients had uncomplicated recoveries, but complications of haematoma (8%), delayed healing and/or graft take (33%), seroma (8%) and recurrence of contracture (8%) were noted. A satisfactory range of movement was achieved with no functional impairment in 92% of patients.

Conclusions: The management of periarticular skin loss presents significant challenges for the burns multidisciplinary team. We demonstrate that satisfactory function can usually be achieved through the adjuvant use of BTM in cutaneous reconstruction and reinforce the importance early physiotherapy input to maximise post-operative function.

Cum grano salis - how useful are skin pH measurements in chemical burns?

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Introduction:

Chemical burns are common, and usually present initially to primary care or emergency departments. Burn referral guidelines typically mandate discussion with - or even transfer to - a burns service, which may be geographically distant.

In these discussions measurements of skin pH are often given greater weight than clinical history or examination.

There appears to be a perception that these measurements provide a more objective measure of severity, despite the fact that previous studies have questioned their reliability.

This study investigates how harmless domestic items can affect 'normal' skin pH, even after removal.

Method:

The normal skin pH of a volunteer was measured, both directly and indirectly using 'universal litmus paper'. A variety of household products were then applied and the skin tested again. This was then repeated at intervals after irrigation (with either tap water or NaCl).

Results:

On direct contact with the household products' the measurements of skin pH ranged from 2-9.

All the acidic agents neutralised within five minutes, and all alkali ones within ten.

NaCl was more effective at neutralisation than tap water.

There was no significant difference between measuring pH directly or indirectly.

Conclusion:

Although measuring skin pH remains appropriate for chemical burns, it is not a reliable single measure for further treatment, unless combined with a good history and appropriate examination.

Such measurements should therefore be interpreted 'cum grano salis' (with a pinch of salt)x and not given undue weight.

Utilising a burns competency framework to train nursing staff in a paediatric burns unit.

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Introduction

Nursing competencies in burns care can be used to train, assess and ensure capability of burns nurses in our unit. By dividing competencies into 3 learning 'phases' we're able to allocate staffing, ensure appropriate skill mix and to deliver a consistently high quality burn care.

Purpose

Burn care nursing competencies were introduced by NBCODN several years ago. In 2019 our service adopted them as a basis for planning training and ensuring nursing competency.

Over a 4-year period we've trained 28 nurses. 17 have completed EMSB course, 3 have completed a certificate in Professional Burns Care (MMU) 2 others are currently undertaking this course.

Methods

The competency document consists of 28 individual competencies. Achieved over a 12–18-month period and assessed with the following assessment matrix

Assessment Matrix:

Score: Taxonomy - Competency Indicator

0: not assessed - Have no experience or knowledge

1: Novice - Requires constant supervision and direction.

2: Advanced Beginner - Requires some appropriate supervision.

3: Competent - Capable of performing without supervision.

4: Proficient - Can supervise or assist others in this area.

The 28 competencies have been split into 3 'phases' specific to our service

Phase 1: basic burn care required by all burn patients i.e. immediate management etc

Phase 2: in-depth knowledge for complex burns i.e. pain management etc.

Phase 3: less used and more complex competencies i.e. escharotomies etc.

These phases are specific to our service and unit level care provided.

Nurses are not allocated to staff burns shifts until they have completed phase 1 to competency level 2, at this point they are supervised by a senior burns nurse who is fully competent & EMSB certified

Once level 2-3 is achieved phase 1 & 2, they can apply for the EMSB course, the enhanced learning this requires enables them to be fully signed by the time they have successfully completed EMSB.

Staff who have completed the MMU Professional Burns Care Certificate are signed off at level 4.

Discussion

The use of this phased learning enables all staff members to be aware of skill mix when allocating staff to shifts, this ensures we have a constant awareness of staffing capabilities and can ensure appropriate support is provided for less experienced staff.

All learning is evidence based and is delivered in a variety of medium, face to face, supernumerary working, prepared PowerPoints etc. This mix of learning methods ensures individual learning needs are met.

Peer support is key to the success of this programme with all burns team members supporting and encouraging learning at all levels.

All level 3 competent staff can sign off junior team members, with final sign off by academically qualified burns specialist nurses and senior staff.

Conclusion

This training is continuously evaluated with all staff members able to suggest new ways of learning or supporting new burns staff.

Being able to assess and ensure knowledge levels as staff develop assists us in providing the best care to our patients and in supporting staff to be empowered by their knowledge and learning.

Burns Practice Improvement Project – Tackling the potential causes of delayed healing in a paediatric burns population

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Introduction

Our project was set up in 2019 as a method of reviewing current practice within our paediatric burns service specifically focussing on patients with delayed healing and aiming to identify possible causes for this.

Data collected as part of the project has been used to inform practice improvements, to guide and structure areas of focus for staff training and to standardise pathways within the patient journey.

Purpose of the study

Delayed healing and its causes was chosen as a focus point for this project due to its impact on not only patient outcomes and wellbeing but also due to the additional time and resources which are involved in caring for this patient group.

Methods

A criteria for identifying delayed healing was established and a healing time of 21+ days was decided as the requirement for inclusion in the project.

Project meetings are held monthly and patients discussed at the meeting once their burns have healed. Dates of healing are monitored to ensure that this discussion happens in a timely manner.

Patient notes are analysed and all interventions within a patients care pathway from admission to wound healing are recorded using a standardised format. Patients are then presented at the monthly meeting which is attended by members of the burns MDT and findings/possible learning points are discussed.

Once identified learning points and significant findings are disseminated to all burns staff via a newsletter and the circulation of meeting minutes. Any changes to practice can then be based directly on the findings and recommendations raised.

(Table 1)

Results/Discussion

Since its conception our project has allowed consistent themes and causes for delayed healing within our paediatric burns population to be identified.

The ability to specify areas of focus for practice improvement has meant that time and energy can be placed on making evidence based changes within these areas.

Introduction of a Quick Pace Change Management learning System in a UK Burns Service

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Introduction – Adaptation and development of the bedside learning coordinator role for quick pace change (Shand et al, 2020) into a team led service management style within a UK burns centre.

Purpose of the study – To investigate if a UK burn service would benefit from a multi-source feedback approach to management.

Methods – Adaptation of the bedside learning coordinator learning system into a team led multi source feedback system with the use of Improve well App. The introduction approach was for the team to access and log in to Improve well app, where staff have the ability to share how they are feeling at work and problems they are facing in their daily role with ideas on how to make an improvement to the service. Weekly meetings were set with the senior Multi-disciplinary team to work through ideas and feedback to the team with comments and outcomes. Along side feedback within the app monthly reports were generated and published on the app and printed and placed on the wall for all staff to see changes implemented.

Results / Discussion – Project data for 8 months shows 51 improvement ideas fed into the system from a range of staff and patients to improve the burns centre. After nine months 27 projects completed, 17 under way and 7 not yet started. Project themes saw patient experience rated the highest reported followed by patient safety, cost saving, time efficiency and other. Staff and patient feedback comments have overall been positive with comments of feeling listened to, engaged in the process of developing the service. The trust has also entered discussions with the company to deliver a trust wide roll out of the system for other areas to benefit from the process.

Conclusion – A quick pace change management system based on the BLC learning model can be effectively introduced in a burns service as a team led quick pace change system to improve patient experience, patient safety, save time and money to the service leading to staff feeling more engaged and listened to within their daily working routine.

Reference - • Shand, J., Allwood, D., Lee, N., Elahi, N., McHenry, I., Chui, K., Tang, S., Dawson-Couper, Z., Mountford, J., Bohmer, R., 2020. Systematically capturing and acting on insights from front-line staff: the 'Bedside Learning Coordinator'

Efficacy of ward-based sedation for paediatric burns dressings, including Epiprotect™ application, in a regional burns unit

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Background

Effective cleaning and dressing of burn wounds is an essential part of their management, leading to improved healing quality and reduced healing time. It is also important to thoroughly assess burn wounds at presentation, to help determine depth and healing potential. The process of cleaning, assessment and dressing can be painful, and effective analgesia is critical in allowing this to be undertaken. This is especially important in paediatric patients, where their age and development may impact on their understanding of what is required

Aims

To assess the efficacy of our sedation protocol for paediatric burns patients, including any complications or cases where sedation was inadequate.

To assess if the current sedation protocol allows application of Epiprotect to appropriate burn injuries without requiring general anaesthesia.

Methods

We reviewed every burns sedation dressing undertaken in our paediatric burns unit during 2021, recording number of dressing changes undertaken, any complications, and the adequacy of sedation. In addition, we routinely apply Epiprotect™ to appropriate injuries, and we collected information on which agents were used to facilitate this.

Results

Throughout 2021, 190 dressing changes were undertaken on the paediatric burns unit. This was a mixture of new assessments and follow-up dressing changes. The standard regime was a weight-based combination of midazolam (0.5mg/kg to maximum 20mg) and oral morphine (0.2-0.3mg/kg rounded to nearest 0.5mg (173 cases). The most common alternative was intranasal diamorphine (0.1mg/kg) (12 cases).

Sedation was adequate in 176 cases (93%). In 9 cases (5%), a higher dose of sedation was required in the subsequent dressing change, but the dressing was able to be completed. 4 cases required a different agent for subsequent dressings (the patients demonstrated excessive excitation as a result of midazolam), and in 1 case the child required a general anaesthetic to allow the procedure. Complications occurred in 5 cases (2 tachycardias, 2 patients vomited and 1 had a panic attack post-sedation), but none of these required specific medical treatment or prolonged their hospital admission.

Epiprotect™ was applied in 36 cases, of which 34 were applied on the burns ward under conscious sedation. 2 cases were applied in the operating theatre under general anaesthesia.

Discussion

The sedation protocol we use was effective in the majority of cases, with very few side-effects. The protocol we use allows assessments and dressing changes to be undertaken on the ward. Very few cases required general anaesthesia, with the associated risks and scheduling challenges. In addition, our sedation protocol supports the effective application of Epiprotect on the ward, which allows for prompt application even when an operating theatre is not available. In our experience, use of Epiprotect™ is associated with reduced pain from subsequent dressing changes, resulting in a better patient and parent experience.

Optimising non-specialist photography of burn wounds – developing an easy guide

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Background

The use of telemedicine has greatly increase over the last few years, and is now firmly established in many burns services. The use of uploaded photographs, either by referring departments, outreach services, or patients is an important part of the telemedicine process. However, the quality of the photos can be very variable, with poor images making it difficult to accurately assess burn injuries, potentially resulting in a reduced quality of patient care. There is currently little guidance on how to optimise the images, which in most cases are taken using a mobile phone or a simple digital camera.

Methods

The medical photography department are experts in taking high quality images of burn wounds. During the COVID pandemic, they also reviewed multiple patient-submitted images prior to uploading to patient records, and so have experience of common issues and pitfalls. Using this knowledge, we developed a simple guide to optimising photos for use in telemedicine. This can be distributed to referring departments and outreach teams, as well as supplied to patients when they are given the telemedicine details

Scale and body location

Take a wide angle photo showing the injury in the context of a whole, easily identifiable body part, as well as closer images of the specific site. For small injuries a scale marker is useful, but a fixed size object is an easy alternative.

Colour

Photos should be taken against a neutral background, with blue or grey the best options. White backgrounds result in underexposure, while black causes overexposure, both of which alter the appearance of the image. Use of a red background causes colour flare, which gives the appearance of erythema.

Background

Minimise other background items, as it can result in the camera focusing on those areas rather than the injury, especially if using an autofocus mode. There is also the risk of accidentally photographing confidential information if in a clinical area.

Flash, focus and zoom

Different lighting results in different appearances of burn injuries. It is best to use the device flash, but mobile phones and simple cameras have the flash mounted close to the lens. If the camera is held too close to the area being photographed, the flash reflects off the injury and 'whites out' the image. The camera should be held at least 1 foot away from the lesion. The zoom function should be used until the lesion fills the majority of the screen. This reduces the flash reflection, and also aids the camera focusing on the lesion, rather than another area.

Selfie-mode

Many mobile phones include a rear-facing camera, allowing the user to take a 'selfie' while still able to see the image. While this may seem a good way of photographing facial and central injuries, it almost always

results in image inversion, making a right sided lesion appear on the left side. The camera is usually of a lower quality, and it is better to get another person to take the photo using the forward facing camera.

Preoperative Assessment Investigations and optimisation for Elective Burns Surgery

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Introduction : One of the main reasons for delay or cancellations of patients needing elective/semi-elective surgery for burns is lack of necessary basic preoperative investigations or errors in scheduling or dosing of their regular medications. Our intention is to evaluate current knowledge followed by analysis of the problem and putting forward a solution in form of a flowchart.

Purpose of the study : Avoid or minimise delays/rescheduling/cancellations of patients needing surgery for their burns injury

Methods : We evaluated the existing knowledge and awareness surrounding preoperative optimisation of patients with a basic questionnaire involving the junior doctors and nurses who are most likely to assess patients in clinic before they are scheduled for surgery. The main focus was on common co-morbidities which are likely to be encountered in day-to-day practice for example hypertension, diabetes mellitus and atrial fibrillation. Knowledge was compared to current best practice guidelines for pre-operative investigations, scheduling of hypoglycaemics agents, antihypertensive medication and anticoagulants. This was then followed by the analysis of the same and finding the lacunae which needed maximum attention. A flowchart was designed as a result to improve access to current guidelines, advice regarding medications and when to contact senior clinicians for further advice.

Results/Discussion : The knowledge surrounding the investigations needed preoperatively and advice regarding omitting or reducing regular medication was subpar due to lack of readily available resources/protocol/guidelines to refer to when scheduling for surgery. We believe this problem is compounded by high turnover rates of junior staff. As a result, we have created a flowchart highlighting common problems encountered and how to manage them. This will be made available on the intranet as well as a copy in clinic and on burns wards. Although a formal post audit survey is pending, we are confident that the introduction of this tool has made a difference in the way patients present for surgery.

Conclusion: It is likely that easy access of resources surrounding preoperative optimisation of patients has led to fewer delays and same day cancellations.

An analysis of burns facility outpatient care for patients discharged from a regional burns centre

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Introduction

Our hospital is a burns facility catering for minor burns in the regional burns network. Patients with more extensive burns are referred to the regional burns unit. These patients are then referred back to our facility for therapy or ongoing care closer to home, once they have recovered from the acute burn, or have received their operative management.

Purpose of the study

This study aims to audit the journey of these patients once they have been discharged from the regional burns unit.

Method

Retrospective data was collected on patients who were repatriated from the regional burns unit for outpatient dressing care and therapy during 2014-2021. Data such as age, sex, percentage of burn (TBSA), number of dressing clinic appointments, outpatient physiotherapy (PT), and occupational therapy (OT) were recorded. The data was analysed with Microsoft Excel 2021 (Microsoft Corporation, USA)

Results

202 patients were repatriated to our hospital for outpatient burn care. No local record was found for 69 patients, and therefore they were excluded from the study.

For the remaining 133 patients, 43 were female and 90 male. The median age was 33 [8 months – 88 years]. The median TBSA for these patients was 3.25% [1-46%]. The range of number of plastics specialist nurse appointments was from 0 to 238, with the median number of nurse appointments being 1. PT and OT had a range of 0 to 17 and 0 to 18 respectively. 43 patients (32%) required at least one appointment with a consultant plastic surgeon in our facility [1-14] with the majority requiring treatment for hypertrophic or keloid scarring. Adult patients were more likely to require doctor clinic appointments (48%) compared to children (10.5%).

Conclusion

Repatriated burn patients require prolonged care in the outpatient setting for dressings, PT, and OT. Although only 133 patients were audited, this number is likely to be much higher as our burns facility receives repatriations from two other burns units, from slightly further afield, that were not included in this audit. Furthermore, 69 patients were excluded due to missing documentation. The majority of these patients require dressing care closer to home. Increased clinician involvement in the adult population correlates to the higher TBSA in this population group compared to children. Our burns facility has demonstrated that this care can be provided closer to home and distributing the workload across the burns network.

Is the current cost of living crisis fuelling increases in hot water bottle related burn injuries in the United Kingdom?

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Introduction

There are an estimated 10 million hot water bottles (HWB) currently in use within the United Kingdom (U.K.) and HWB related burn injuries represent a significant resource burden to UK burn services (1,2). These injuries can be caused through a variety of mechanisms including scalds sustained when filling the bottle or due to leaking or rupture and contact burns.

The fuel poverty crisis started in February 2022 reflecting in an estimated six-fold increase in alternative sources of heating, in particular HWB. In this project, we wish to understand whether this has translated to an increase in the incidence of burn injuries caused by hot water bottles.

Method

Prospectively collected data of all HWB injuries from three Southwest burns services from February 2021 to January 2023 was retrieved from the UK International Burn Injury Database (IBID). Data was collected on patient demographics, injury mechanism, anatomical location and outcomes. The data was collated and analysed using Microsoft ExcelTM.

Results

In 2021, seven children and 68 adults sustained burn injuries from HWB. In 2022, 22 children and 73 adults were assessed and treated by burn services for injuries secondary to HWB.

In 2022, the average total body surface area (TBSA) in the paediatric group was 1.53% with the abdomen most commonly affected. One patient required admission for four days. The average time from initial injury to complete healing of the wound was 7.5 days suggesting the majority were superficial dermal injuries. The average TBSA in adults, with a mean age of 48 years, was 1.08 % (1.05% partial thickness, 0.03% full thickness) with the left dorsal hand most commonly injured. Of these 78% were scald injuries and 22% were contact burns. No patients required inpatient admission.

A high proportion of these injuries occurred whilst filling the HWB in both study groups (42% in adults, 53% in children).

Conclusion

The UK fuel poverty crisis has led to a 7% increase in adult HWB injuries across the Southwest and triple the number of paediatric patients attending our services between 2021 and 2022.

In response, the Bristol Children's Hospital burns service has produced a burn prevention video to increase public awareness about the risks of burns when using HWBs. We contacted a major manufacturer of HWB within the UK to obtain clear guidance on how to check the safety of HWBs. We are working with them and other manufacturers to ensure products on sale in the UK carry adequate burn prevention advice.

Novel Haematological and Neutrophil Parameters in Severe Thermal Injury

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Introduction

Severe thermal injuries remain a significant cause of morbidity and mortality. Previously, in studies that acquired blood samples during the early (days 1, 3, 7, 14) and late (days 28, months 3, 6 and 12) post-burn phase, we demonstrated a significant increase in novel neutrophil parameters (NEUT-Y, NEUT-RI) in septic burn patients that reflect significantly high levels of nucleic acid content (Dinsdale et al, 2017). We also identified significantly high levels of immature granulocytes (IG), cell-free DNA (cf-DNA), and dysfunctional neutrophils on day one post-burn as potential early biomarkers of sepsis (Hampson et al, 2017). However, the intermittent blood sampling schedule of these studies prevented us from gaining a detailed understanding of the post-burn immune response.

Purpose of the Study

Here, in a follow-on prospective study (SIFTI-2) of severely-injured burns patients, we acquired daily blood samples across the first 14 days post-injury to provide a more comprehensive insight into the kinetic profile of the post-burn immune and inflammatory response.

Methods

Blood samples were collected from up to 90 thermally-injured patients (TBSA $\geq 20\%$) at days 1-14, day 28 and months 3, 6 and 12 post-burn. IG count and extended neutrophil parameters were measured in whole blood using the Sysmex XN-1000 haematological analyser. Plasma cf-DNA levels were measured by a fluorometric-based assay using SYTOX Green Dye. Normal healthy controls (HCs; N = 20) were also measured. Sepsis was diagnosed according to the ABA criteria. Prognostic modelling of all the SIFTI-2 data and Sepsis diagnosis are examined for 9 time points: days 1 to 7 inclusive, and days 14 and 28.

Results/Discussion

IG counts were significantly elevated relative to HCs on days 1, 4 ($p < 0.05$), 5-7, 14 and 28 post-burn ($p < 0.001$). A significant post-burn increase in plasma cf-DNA levels and Neut-Y was also observed on days 1-7, 14 and 28 post-burn ($p < 0.001$). Neut-RI was significantly increased at all time points ($p < 0.0001$). Neut-Y levels (i.e. increased DNA fluorescence) peaked at day 6 compared to day 8 for cf-DNA, and both were significantly correlated across time ($R = 0.51$, $p < 0.0001$). As neutrophil extracellular traps (NETs) are a predominant source of cf-DNA post-burn, determining Neut-Y levels could offer a rapid measurement for the detection of NET-derived DNA on cells before its release into plasma. The early prognostic association of day 1 admission cfDNA and Neut-Y levels, IG count and the revised Baux score with the development of sepsis was fair, with an AUROC of 0.779 (95% CI 0.668-0.89).

Conclusion

Measurements of novel haematological and neutrophil parameters confirm our previous findings that IG, Neut-GI, Neut-Y and cf-DNA are significantly increased after thermal injury. However, this study did not find that these parameters are strong predictors of sepsis when measured on day 1 post-burn. The Neut-Y parameter with increased DNA fluorescence offers a rapid potential Point of Care test for the measurement of cell associated NETs.

Characterisation of Neutrophil-derived Cell Free DNA (cf-DNA) In Burns and Trauma

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Introduction

Increased plasma levels of cell free DNA (cf-DNA) are observed in patients after severe thermal and traumatic injuries. The majority of cf-DNA is generated from neutrophil extracellular traps (NETs) and not only implicated in the pathophysiology of multiple organ failure (MOF) but may provide an early biomarker for sepsis (Hampson et al, 2017). DNase degrades NETs into nucleosomes with ~150 base pairs (bp) of DNA wrapped around an octamer core of histones. Large circulating chromatin fibres have also been observed in burns patients (Otwara et al, 2018).

Purpose of the study

To understand the dynamics of NET-derived chromatin and cf-DNA generation and degradation in burns and trauma patients and to study their potential biological activities on isolated cells.

Methods

cf-DNA concentrations were measured in post injury plasma samples obtained from patients with severe burn (>20% TBSA) and traumatic injury (ISS >8) on days 1-28 and ≤1-72 hours, respectively and compared with healthy controls. DNA was also extracted from plasma and analysed by electrophoresis (Agilent 2100 Bioanalyzer) to determine DNA size (bp). As an in vitro control, DNA was also measured from purified NETs generated from neutrophils stimulated with 50 nM PMA for 4 hours and digested with DNase, MNase or DNase 1L3. Purified cf-DNA from burns samples and NETs were also incubated with purified neutrophils in vitro. CD11b expression, CD62L shedding, myeloperoxidase (MPO) and Interleukin-8 (IL-8) release were measured. In addition, treated neutrophils were stained with SYTOX and anti-citrullinated histone 3 antibody and visualised by microscopy. Extracellular chromatin was quantified with ImageJ software.

Results/Discussion

Unresolved high molecular weight DNA was detected in the acute post-burn phase (days 1-4), which was digested down to nucleosome bands at ~150 (bp) at later time-points (days 6-14) that persisted up to 28 days. The density of nucleosomes correlated with cf-DNA levels. Healthy donor plasma, with low cf-DNA levels contains no nucleosome bands. A ~150 bp nucleosome band was also detected in trauma patient plasma at all sampling time-points. In samples acquired 1-hour post-injury, higher molecular weight nucleosome oligomers (i.e., ~ 300 and 450 bp) were also detected. DNase I and MNase digestion of NETs generated nucleosome bands in vitro, although DNase 1L3 generates larger DNA sizes. Incubation experiments of cfDNA with purified neutrophils do not show activation of treated neutrophils with CD11b expression, CD62L shedding, and IL-8 secretion. However, high concentrations of cf-DNA results in significant MPO release and microscopy demonstrate that NET derived chromatin is released.

Conclusion

This study demonstrates that circulating NET-derived DNA fragments in post-injury burn and trauma samples are composed of a predominant ~150 (bp) nucleosome band. Ultra-early trauma samples (<1h after injury) also contain larger nucleosome oligomers. In vitro digestion of NETs confirms the role of DNases in breaking down NET-derived chromatin into nucleosomes. Purified nucleosomes do not demonstrate the ability to further activate neutrophils but a significant release of MPO and NETs can be induced. High concentrations of nucleosomes therefore appear cytotoxic to neutrophils and induce NETosis which may further contribute to DIC and MOF.

An Innovative method of hand splinting in burns: A case example.

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Introduction:

Hand burns can have a negative impact on function and quality of life. Splinting is an essential component of hand burn management. Splints can assist with oedema resolution, maintain soft tissue length, protect vulnerable structures, prevent joint contracture, and preserve function.

The position of safe immobilisation (POSI) is well documented in both hand therapy and burn literature. This position preserves the hand arches, maintains the length of the metacarpophalangeal collateral ligaments, and keeps the thumb in functional abduction and mid opposition.

Oedema in the dorsum of hand and around the thenar muscles causes hyperextension of the metacarpophalangeal joints with interphalangeal joint flexion. The palmar arches flatten, and the thumb adducts, reducing the first web space. The presence of oedema following a burn may make fabrication of a POSI splint challenging, particularly when oedema is located around the thenar eminence.

The trigger for developing a new splint design was the admission to the intensive therapy unit of a male with burns, with extensive hand oedema. The patient was a manual worker and had large hands with well-developed thenar muscles. Additionally, he was receiving high levels of inotrope support, which raised concerns about risk of pressure areas, particularly to the border of the thumb, first web-space and thumb tip from a traditional POSI splint.

Purpose of study:

We present a new innovative design, of a 'wrap around' thumb splint created by our Burn Centre's clinical lead occupational therapist to address the challenges surrounding splinting in hand burns.

Method:

The standard POSI splint design was adapted; instead of the thumb component being moulded into the first web space and extending along the full length of the volar surface of the thumb, the thermoplastic material was wrapped around the proximal phalanx and over the IPJ of the thumb, holding it in abduction without the need for a restraining strap.

Discussion:

The wrap around thumb design has several advantages over the traditional POSI splint:

1. The splint can be fabricated over both dry dressings and bag dressings
2. It reduces the risk of skin breakdown in vulnerable patients
3. It is easy to mould around oedematous and/or muscular hands

Conclusion:

Our design of a wrap around thumb splint has made it easier for us to manage splinting in oedematous hand burns.

This design is particularly suited to male hands which tend to have large, well developed thenar muscles. In addition, this splint is useful for patients with co-existing chronic degenerative conditions who can benefit from the increased support to thumb joints and extra-articular structures.

Our unique design uses a similar splint pattern already well known to burns therapists and therefore any staff with splinting experience, will easily be able to follow the instructions to create the wrap around thumb design.

The wrap around or circumferential use of any splint should be undertaken with caution, if the risk of digital or hand compartment pressures are compromised. Regular monitoring will be required in some instances.

The management of neck contractures: a multidisciplinary approach

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Introduction:

Neck contracture following a burn injury can have severe functional, aesthetic and psychological implications.

Early therapeutic intervention in neck burns is essential to maintain range of movement (ROM), neck contour and to support surgical intervention by way of splinting.

Purpose of the study:

Via case study:

- 1) Outline our multidisciplinary team (MDT) approach to neck contracture management
- 2) Demonstrate the role of neck splinting in this process

Method:

A 31 year old male was admitted to the intensive therapy unit (ITU) with a 65% total burn surface area (TBSA) accelerant induced flame burn, which included full thickness burns to his neck. Escharotomies to the neck were performed immediately, followed by early debridement and split thickness skin grafting (STSG).

Whilst the patient remained intubated, neck ROM was maintained through positioning and passive range of movement (PROM) exercise. Unfortunately, once extubated, compliance with therapy decreased, which resulted in the development of neck contractures. Early neck splinting using conformable thermoplastic material was commenced, combined with active and passive stretches and positioning him at rest, without pillows to encourage extension.

Despite early therapeutic intervention, he developed bands of scarring and loss of neck contour, which resulted in a flexed and rotated head position. This affected balance and negatively impacted on his ability to complete activities of daily living.

Four months after the original injury, the patient accepted the need for scar revision surgery and became more compliant with his treatment. He underwent neck release surgery and STSG, with the aim of improving ROM and neck contour.

Immediate neck splinting was performed in theatre. Regular remoulds of the splint were required post operatively, primarily due to changes in bulk of dressings. Neck extension stretches in supine were advised. 3D scanning, performed by the prosthetics team was used rather than conventional casting due to poor patient compliance and to create a splint which addressed contour and scar occlusion.

Discussion:

Intra-operative thermoplastic splinting, carried out by occupational therapists, gives the best opportunity to maintain surgical gains.

Whilst ROM measurements allow assessment of functional gains, 3D scanning can be used to fabricate a splint and subjectively demonstrate neck contour change.

To minimise neck contractures, we recommend:

- An MDT approach
- Attention to positioning
- Customised thermoplastic splints for positioning vs prosthetics splints for contouring and scar management
- An objective measurement tool to measure changes in neck contour and cervical spine ROM.
- Vigilance around pressure areas
- Patient information/ dialogue to maximise compliance

Conclusion:

An MDT approach is essential in the management of neck contractures to ensure optimal outcomes. However, it is also important to note that despite a rigorous splinting and positioning protocol, lack of patient compliance can have a negative impact on outcomes.

3D scanning has the potential to provide objective measurement of neck contour and ROM, however this needs further research.

In our case study, early splinting in intensive care may have reduced the severity of this patient's contractures and this will be considered for future management of extensive neck burns.

Low temperature silicone-lined thermoplastic splinting - an additional scar management tool and case example.

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Introduction:

Choosing the most appropriate thermoplastic material for splinting is usually based on conformability when heated and the rigidity of the resulting splint once the material has cooled. Literature supports the premise that splinting, pressure therapy and the use of topical silicone can have a positive impact on burn scar modulation.

Silon[®] low temperature thermoplastic material (Silon-LTS[®]) is the first product to combine low temperature thermoplastic splinting with a silicone lining, in a single-step product.

Purpose of the study:

To explore the utility of Silon-LTS[®] in the management of burns scarring using a case example.

Method:

A 43-year-old male sustained full thickness bilateral hand burns.

He underwent NexoBrid[®] debridement and grafting at another burns centre and was transferred as an outpatient to our burns centre.

Initial grafting to his dominant (right) hand had failed due to Group A Streptococcus (GAS) infection, resulting in delayed healing. This, combined with his Fitzpatrick skin type I/II, increased his risk of developing hypertrophic scarring.

At initial assessment, the modified Vancouver Scar Scale (mVSS) score was seven. There were multiple areas of break-down, because of skin dehydration and extrinsic scar tension.

Skin break-down persisted over many months which had a negative impact on his ability to wear pressure garments and on the use of silicone, since neither of these scar management modalities should be used over broken skin.

Since neither topical silicone nor pressure garments could be used, the decision was made to trial splints fabricated from Silon-LTS[®]. The splints were designed for night-time only and used every night, for 9 months. These splints were a clam style design, not used for sustained static positioning like conventional splints, but primarily used to hydrate and occlude the skin whilst also applying gentle pressure. This allowed some opportunity for gentle pressure and occlusion to the dorsum of the hands at a time when pressure garments could not be worn. Areas of breakdown on the digits and metacarpophalangeal joints (MCPJs) were avoided by the splints to allow healing. Serial photographs taken throughout treatment demonstrate progression.

Discussion :

Clinical assessment demonstrated improvement to dorsal scarring, with softer, flatter, well hydrated and more pliable skin.

Only minimal change in mVSS score was noted, down one point, from seven to six.

Although the mVSS score showed little change, the score is generally applied to the worst area of scarring and therefore doesn't necessarily reflect improvement over the scar as a whole.

Other scar management tools were used in the care of this patient, including steroid injections, LymphaTouch[®] and pressure garments once he was fully healed. The positive impact of these treatments on hypertrophic scarring cannot be assessed.

Conclusion:

Silon-LTS[®] is a splinting material with additional scar management properties. The product can be remoulded several times making it cost efficient and an option for silicone delivery when sheets, gels or elastomers are not appropriate due to the presence of open wounds.

Early identification of burn-related heterotopic ossification - the gap between clinical and radiological diagnosis

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Introduction:

Heterotopic ossification (HO), a condition which results in deposition of lamellar bone in extra-articular soft tissues, is an uncommon, but debilitating complication following burn injury.

Long-term sequelae of HO include pain, reduced range of movement and function, and rarely, nerve entrapment.

Current radiographic modalities are inadequate in enabling early diagnosis and treatment of HO, potentially resulting in lengthy hospital stays and poorer outcomes.

Purpose of study:

- 1) Identify clinical parameters which may indicate the presence of HO at an early stage, including in ventilated/sedated patients
- 2) Review the literature evaluating sensitivity, specificity, and clinical utility of various imaging techniques for identifying HO
- 3) Develop a standard operating procedure (SOP) to facilitate early diagnosis and treatment of HO

Method:

A retrospective review was done of all patients' notes with confirmed HO who had been admitted to our burn centre between September 2020 and August 2022. Our review identified:

- 1) Initial signs, symptoms, and clinical features
 - 2) Time delay between first suspicions of HO being raised, and confirmed diagnosis
 - 3) Diagnostic imaging techniques used to confirm diagnosis and their sensitivity and specificity
- Alongside case note analysis, a literature review was conducted, evaluating the imaging options and their utility with this cohort of patients.

Results:

During the study period, there were three confirmed cases of HO, one involving the knee and two involving the elbow, one with concomitant ulnar nerve compression.

In all three cases, the suspicion of HO was initially raised by therapists whilst the patients were ventilated and sedated on the intensive therapy unit (ITU).

The common clinical features across all cases were:

- 1) Non-verbal expression of pain (e.g. grimacing) during passive exercise of the affected joints
- 2) Loss of passive ROM in one or more planes, unexplained by dressings inhibiting movement or a developing scar contracture. In both cases of elbow HO, loss of supination was an early feature
- 3) A bony joint end feel

The delay between clinical suspicion and plain film diagnosis was 16 to 42 days. In all cases, initial x-rays were normal. In two cases, CT scans performed within days of the first positive x-ray showed more extensive disease than suggested by plain film.

Discussion:

Literature review suggests a time-lag between clinical symptoms and radiological diagnosis. CT scans and 3-phase radionuclide scans are more likely to detect immature bone formation at an early stage. However, practicality for use in major burn patients who are often ventilated and clinically unstable, with significant infection control barriers, remains limited. Ultrasound at the bedside may detect soft tissue abnormalities early but lacks sensitivity and specificity.

We found clinical diagnosis to be better than radiological diagnosis in the initial stages of HO and believe HO should be formally diagnosed following clinical suspicion at the earliest opportunity.

Conclusion:

A SOP is presented which uses clinical assessment and practical imaging to facilitate early diagnosis of HO. Further research is required to identify the most effective intervention to mitigate HO, however early diagnosis is likely to provide the best opportunity for successful management.

Are hot water bottles injuries related to the recent energy crisis?

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Burn injuries from heating equipment and appliances remain a considerable portion of the Burns workload. Scald injuries from hot water bottles are frequently preventable injuries, but doing so involves a wide-ranging social initiative to educate and inform societal behaviours. We have locally observed an increase in hot water bottle scalds over the last two years and sought to understand whether this may be related to current inflationary pressures and the wider impact of increased cost of living.

We have therefore analysed 5 years of hot water bottle and radiator scalds within our unit (January 2017 – December 2022) against national data for cost of living (CPIH), energy costs, and seasonal temperature within the region. The overall number of hot water bottle scalds increased to 100% between 2020-2022 (98 patients a year in 2021, and 98 patients a year in 2022 from a 2017-2020 average of 49 patients). The increase strongly correlated with the increase in CPIH cost of living over 2020-2022 ($t=2.71$, $P=0.01$), and less strongly with the increase in CPIH cost of living over 2022 ($t=-1.84$, $P=0.07$), and whilst monthly caseload is strongly related to winter temperatures ($t=2.11$, $P=0.04$), winter temperatures themselves did not significantly impact the number of burns year on year ($P=0.6$). Over the same period, there was no increase in radiator contact burns (38 patients in 2022 vs. 36 patients 2017-2020 average).

In summary, there is a strong correlation between cost-of-living increases over the last two years and an increased incidence of hot water bottle scalds. The use of a hot water bottle is part of a wider decision-making process around home heating, insulation and finances. Within the wider context of an injury, the hot water bottle may presently be an overlooked indicator of someone for whom these are pressing issues. This has implications for the burns multidisciplinary team with regards to discharge planning, signposting and support, safeguarding of vulnerable patients and co-ordination with social care and other services, and should therefore prompt investigation when appropriate.

8-year follow-up of an original case of enzymatic debridement in the UK

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Bromelain-based enzymatic debridement of burns injuries with Nexobrid remains a technique with limited but substantial use in the UK, with the first literature from UK centres published in 2012. Enzymatic debridement represents an alternative to surgical management in a select group of patients, but with specific implications for both unit resourcing and long-term outcomes. We present 8 year follow-up of an early case of enzymatic debridement.

The patient, now 84 years old, presented in February 2015 following a hot oil scald at home, from which she sustained approximately 4% TBSA full thickness burns to her left arm. On account of her medically co-morbid cardiovascular status, the patient was keen to avoid a general anaesthetic or surgical procedure. She was therefore managed with enzymatic debridement of full thickness burnt areas to lateral arm, upper arm and shoulder, necessitating a brachial block supplemented with interscalene block. 8 years post injury, functional outcome post injury was acceptable to the patient, with full range of movement and complete return to normal activities of daily living.

The consensus on effective patient selection for enzymatic debridement has evolved over the last decade. As a result of its relatively recent adoption, longitudinal outcome data for these patients is still lacking. This case demonstrates that preliminary use of this technique has borne acceptable long term results and similar cost despite radically different service requirements in the acute phase.

Cumulative Sum Analysis: A 10 Year Experience of Burns Outcome Audit

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Large burns remain an injury with a significant mortality in the acute setting. Although the factors contributing to substantial burn injury are complex and individual, effective high acuity care and early definitive management remain the gold standard treatment for large burns. In this context, we present our experience using the Cumulative Sum Analysis (CUSUM) tool within a regional burns centre as a means to conducting continued targeted and effective audit over a 10-year period.

The CUSUM tool plots a zeroed variable life adjusted display (VLAD) based on predicted mortality minus actual mortality for each burn admitted to intensive care. Cumulative survivorship or deaths (± 2) above predicted mortality trigger focused internal audit of the last six relevant cases. Predicted mortality is adjusted based on modified Baux score, Belgium score, Abbreviated Burn Severity Index and Ryan score and has been refined over the course of the model.

Over the 10-year experience of using this tool, audit has been triggered six times, twice for excess deaths (2019, 2021), and four times for excess survivors (2014, 2016, 2019, 2021). Audit process involves interviews or reports from all members of the Burns MDT involved in preceding six patients and a subsequent audit meeting. Relevant themes are then identified and disseminated back to the burns team. These have included revision and improvement of gut and feeding protocols, a focus on manner and timing of patient transfer to the Burns Centre, and regular re-education around common complications of Burns and Intensive Care. Similarly, survivorship audits have continued to highlight the critical nature of prompt decision making and early intervention in significant burns injuries and the vital contribution of communicating effectively in well-resourced multi-disciplinary team. CUSUM also continues to form part of a wider body of evidence-based practice supporting decision making in the burns setting, including timing of interventions and ceiling of care discussions.

Absent consensus on skin preparation and antibiotic prophylaxis in burn surgery

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Acute infection of burn wounds remains an issue of significant concern within burn surgery. Complications include graft failure, delayed healing, and increased scar morbidity in the long term. Furthermore, the particular susceptibility of the burn patient population to colonisation with difficult to treat, resistant organisms puts an increased emphasis on the need for effective rather than excessive antisepsis in the peri-operative period. We conducted a survey of UK and European burns centres with a view to understanding the current state of burns wound antiseptic preparation and prophylaxis in the surgical setting.

59 burns units responded, including all Units and Centres in the United Kingdom and Ireland. 24 services used single preparation (42.9%), 18 services used a double preparation (32.1%), and 14 services used a triple preparation method (25.0%). There was no consensus on formulation for preparation, with 13 different solutions used, although the most common solutions were aqueous betadine (57.1%), aqueous chlorhexidine (32.1%), and alcoholic chlorhexidine (19.6%). 35 services used prophylactic antibiotics during surgery (60.3%), of which 24 services used antibiotic prophylaxis during both debridement and grafting (41.4%).

There is a clear discrepancy between the antibiotic and skin preparation use in different services. Given the dearth of literature pertaining to skin preparation in burns patients, and in the light of recently updated NICE guidance regarding first choice skin preparation, there is an imperative to conduct large scale research into the optimum burns antisepsis and prophylaxis in the surgical setting.

Celebrity patients with significant social media presence: an opportunity to highlight fire safety and burns prevention? – #StopDropRoll

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Introduction

A well-known celebrity required treatment in two UK burn services following major flame burns in 2022. The injury was sustained from clothing fire whilst cooking on a gas hob. The patient was unaware of the “Stop, Drop & Roll” technique which may have potentially reduced the severity of their injuries. This patient worked closely with the local fire Service to raise awareness through social media of the importance of the “stop, drop and roll” technique in the event of a clothing fire. As part of National Burns Awareness Day 2022, they worked with our burns service to highlight burns prevention with a local news interview linked together with social media.

Purpose

The purpose of this study was to identify the impact of this patient’s fire safety campaign using the simple hashtag #StopDropRoll via multiple social media platforms.

Methods

The terms #StopDropRoll, National Burns Awareness Day and the patient’s professional name were used on various social media and internet search engines to quickly identify the impact of this multi-faceted campaign during 2022.

Results/Discussion

The study results demonstrated that the #StopDropRoll Campaign was successfully promoted and accessible to the patient’s 70,199 collective followers through social media and was available on five National and eight Regional on-line news websites. Campaign viewing figures for the on-line news sites were not available, however their news interviews had been watched on Twitter 37,600 times. A total of 6921 social media viewers liked his fire safety posts, 160 commented on them, and 241 retweeted or shared them.

The key advantage of fire safety/burn prevention campaigns utilising social media platforms is that key messages can be rapidly cascaded in a few clicks. The World Health Organization (2020) advocate that health interventions disseminated via social media can influence society to adopt new lifestyles (cited in Johar et al 2021 p 1686). Atiyeh et al (2009) stated that delivering a Burn and Blast Awareness campaign through social media platforms solved issues of audience accessibility, was less labour intensive and more environmentally friendly. The Fire Brigade Union (FBU) 2023 state social media platforms allow quick dissemination of public fire safety messages, but access is limited to social media users (around 85% in the UK). The FBU recommends social media platforms should be used as part of a wider campaign which includes reinforcement through traditional face-to-face community education methods.

Hoffman & Tan (2015) concluded that Celebrities are extremely influential with changing knowledge, attitudes, and decisions relating to our health. However, it is vital that health professionals work collaboratively with celebrities to promote expert evidence-based practices rather than celebrities speaking of their free will.

Conclusion

Fire safety and burn prevention campaigns can be disseminated effectively using social media platforms and exposure may be widened with the participation of celebrity patients when appropriate. They can penetrate a vast audience, are environmentally friendly and less resource intensive. The utilisation of social media in burn safety and prevention campaigns is the future, but online campaigns should run in tandem with a multi-pronged traditional approach.

Chemical burn secondary to elemental metal exposure:A case report

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Introduction:

Exposure to elemental metal is a very rare cause of chemical burn injury in the civilian population. A literature search revealed just 2 cases documented since 1998. Despite the rarity of these injuries, it is important that first aid providers and clinicians are aware of first aid measures, given it goes against the fundamental teaching for all other burn injuries.

Purpose of study:

To highlight the potential repercussions of mismanaging burns from elemental metals which are not featured in the protocols for the management of such injuries, and feed this into the local and national protocols that currently exist.

Methods:

We use lessons learned from a case study for the purposes of updating the chemical burns management protocols and material safety data sheet currently available for potassium metal.

Discussion:

A 12-year-old female presented to the burns unit following an incident that took place in a chemistry lab at school. After an exothermic reaction between liquid paraffin and elemental potassium, the patient was struck with the latter sustaining a small burn to the forehead.

First aid involved wiping off the material and applying a cooling gel.

On arrival at our burns unit, she was found to have a small, superficial partial thickness 5 pence coin -sized burn to the central forehead with some chemical residue still in situ.

The case was discussed with one of the military burn surgeons, who advised:

1. Bulk decontaminate any visible residues to stop the local reaction using oil or soap.
2. Dispose of the material meticulously according to the local protocols.
3. Wash with copious amounts of diphoterine and apply a sterile dressing with diphoterine to cover the contaminated area.
4. Monitor the pH until below 9 and the casualty is pain-free.

The treatment was successful and the burn healed within 7 days.

If water was to be applied to an elemental metal burn injury, any residue would explode or ignite on contact. This is caused by hydrolysis with oxidation of the alkaline metal. The products of which include hydrogen gas and the hydroxide ion OH⁻, making the residue very alkaline. Interestingly, the material safety data sheet for potassium metal, inaccurately advises to “immediately flush the skin with plenty of water for at least 15 minutes”.

Chemicals that react strongly with water can be classified into the following families:

1. Alkaline metals, such as lithium, sodium, potassium
2. Chlorinated silicone compounds
3. Metal alkyls such as aluminium, zinc, magnesium, or lithium
4. Acid chlorides
5. Lewis acids e.g. titanium trichloride or phosphorous pentachloride
6. Metal phosphides such as aluminium or magnesium phosphide
7. Phosphorous sulphides
8. Sulfonyl isocyanates
9. Metal hydrides

We have added a learning podcast to the advanced burn module to aid in the recognition and initial management of Elemental chemical burns.

Conclusion: There are a variety of chemical substances that have the potential of causing a catastrophic reaction if mismanaged, Clinicians should be knowledgeable of these reactions and management of exposure to such chemicals to avoid short and long-term complications.

Toxic Epidermal Necrolysis - Optimal Management (TEN-OM) – a retrospective cohort analysis from a single centre.

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Objectives: To describe a range of culpable drug classes in aetiology of TEN, evaluate the clinical factors associated with worse prognosis in patients with TEN and compare treatment efficacy.

Design, setting, and participants: TEN-OM is a retrospective cohort analysis of adult patients with TEN admitted to our unit from 2010 to 2022. It is a multidisciplinary project including dermatology, plastic surgery, ophthalmology, and gynaecology teams.

Thirty-two cases were identified from clinical records and 23 met criteria for inclusion in a semi-quantitative analysis. The majority of patients were Caucasian (n=13) females (70%) with a median age of 44 years (IQR 23.5-59). Most patients had a SCORTEN 2 (n=7) on admission and the highest score was 5 in one case.

Main outcomes and measures: The primary outcome was a frequency of culpable drug classes. Secondary outcome measures were correlations between: SCORTEN and length of stay, SCORTEN and days to re-epithelialization, albumin and length of stay, albumin and days to re-epithelialization, systemic treatment and length of stay, systemic treatment and days to re-epithelialization.

Results:

Antibiotics constituted the largest category of culpable drugs (n=6) and all three cases in the antiepileptic category were attributed to lamotrigine. Patients were admitted for approximately three weeks (median 17.5, mean 23.6) with the median time to re-epithelialisation of 9 days. The mortality rate was 9%; the BSA of the three deceased patients was 60%-90% and the SCORTEN 4 or 5. There was no correlation between SCORTEN and length of stay or SCORTEN and days to re-epithelialization. There was a possible correlative trend between nadir serum albumin and length of stay that requires a larger sample size for further quantitative evaluation.

Most patients received IVIG (97%) and in those the 'Chelsea Protocol' (2g/kg on day one followed by 1g/kg on day two and three) was followed in 33% cases. Other systemic treatments included ciclosporin (48%), GCSF (65%), etanercept (9%) and systemic steroids (39%). Quantitative analysis to determine optimal systemic treatment was not performed due to the small sample size, the main limitation of this study. Most patients had more than one treatment simultaneously.

The majority of female patients had vulval involvement (81%), but only one patient required dilators. Male urethral examination was not documented. Eye involvement was observed in 87% and a quarter of those patients required amniotic membrane transplant. Almost all patients required steroid eye drops (90%).

Conclusions and relevance:

We provided a detailed descriptive demographics of our cohort of patients with TEN including a range of culpable drugs. Although we were unable to perform efficacy analysis of the treatment performance due to small sample size, there was no trend towards one therapy over another that had a difference in outcome. This project has led to collaboration with the Ophthalmology team to design guidelines for management of

ocular disease in TEN; this is time critical to mitigate the risk of blindness. The next stage of the project is focused on retrieving historical data to perform adequately powered quantitative analysis.

Audit of the referral system for acute burns at a regional burn centre

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¹*Mersey Regional Burns Centre*

Introduction:

Safe patient care requires effective, timely and appropriate transfer of key information. This is particularly pertinent in the urgent and emergency care settings. This allows referrals to be appropriately triaged and managed. Our Burns Centre receives patient referrals daily from various regional primary and secondary care facilities. Based on the National Network for burn care (NNBC) guidelines, referrals are triaged by doctors and a decision made for either inpatient admission, clinic same-day assessment or future reviews, or advice only.

Referrals are a key clinical process, undertaken by all healthcare professionals and can have direct consequences on patient care and experience, as well as secondary financial implications on the NHS. The deficiency of clinical information received from referrers prompted a review of our existing referral process.

Purpose of study:

- 1) To assess and improve the clinical content of referrals received at our Burns Centre.
- 2) To improve the process of sending and receiving referrals by developing the existing referral system and standardising the information received.

Methods:

Referrals of fifty patients were randomly selected from our Burns Centre's existing referral system. Set data points were analysed to assess the inclusion of key clinical information, medical photography, contact details and referral outcomes within all referrals examined. Following this initial review, a new referral process was developed and implemented. The new referral system included an automated email response with a standardised referral document (adapted from the Network's burn care referral information pack 2016) requesting pertinent patient information. A further fifty patients referred through the new system were randomly selected to assess and compare the same data points as those in the first cycle of the audit.

Results:

Following implementation of the new referral system, significant improvement in the content of referrals received was demonstrated across all data points analysed. The inclusion of our standardised referral form was seen in 88% of referrals received in the new system compared to 23% previously. An improvement of between 41-64% was observed in all data points regarding clinical information concerning the patient and the burn injury. A percentage increase of 780% was observed in the inclusion of patient and referrer contact details within all referrals received.

Conclusion:

Detailed referral information is important to allow for appropriate arrangement of patient care. Our Burns Centre's referral system has been streamlined to make the referral process more efficient for both the referrer and clinician receiving the referral. The inclusion of a standardised referral form allows the referrer to be prompted to include key information within the referral. The new referral system additionally provides traceability, allowing all referrals to be archived allowing for further audit and follow up as necessary. Furthermore this email system is secure and password protected, only accessible to burns and plastic surgery doctors, in line with general data protection regulation.

Deep heat – cause for concern?

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Introduction:

Products containing Methyl salicylate and menthol are commonly used as over-the-counter remedies for musculoskeletal conditions such as bruises, sprains, back ache, rheumatic pain and minor sports injuries. These are available in the form of sprays, gels, creams or patches. Deep Heat is one of the more common brands and contains active ingredients 12.80% methyl salicylate, 5.9% menthol, 1.97% eucalyptus oil, turpentine oil 1.47%.

Chemical burns have very rarely been reported as a complication of topical methyl salicylate and menthol treatments.

Purpose of study:

Through a case report we highlight concerns surrounding the potential for chemical burns from the use of a popular over-the-counter (OTC) product Deep Heat, and raise the need for public awareness.

Methodology:

We review the rare case of a patient who sustained 1.5% TBSA burns following the application of Deep heat cream to bilateral calves.

Discussion:

An 87-year-old male sustained cutaneous burns to both legs following application of OTC Deep heat cream. The patient had applied the Deep Heat rub twice daily for two days to his calves and popliteal fossae after suffering ongoing aching following prolonged physical activity. He developed blistering and cellulitis and on review at the burn centre was assessed to have 1.5% TBSA skin loss as well as cellulitis arising from the burn. He was admitted for intravenous antibiotics and dressing care. All wounds were superficial partial thickness and went on to heal without further complications within 10 days.

Conclusions:

Whilst the risk of cutaneous burns and blistering is detailed in the product literature, this complication is exceedingly rare. Both patient and clinician awareness of the risk from this common OTC treatment is essential to ensure timely treatment to minimise severity of cutaneous burns.

Exploring patients' perception on the utility of temporary self-applied tattoos for scar camouflage in burns

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Introduction:

Scars, more especially extensive scars seen in burn patients are challenging to manage. Patients with scars often request treatment or improvement of their scars. Medical treatment of scars eventually leads to an endpoint beyond which further treatment is futile. Where further scar treatment is ineffective, various camouflage techniques such as make-up can be used to make the scars less conspicuous and more acceptable to patients. Simple non-medical approaches like using temporary self-applied water-transfer tattoos to camouflage scars can be another solution for patients looking for temporary camouflage of their scars for special occasions or even day-to-day life. Furthermore this simple approach can also serve as a precursor to permanent cosmetic tattoos where patients can try various designs and colors before embarking on permanent tattooing for scar camouflage.

Purpose of study:

To demonstrate the utility of water-transfer tattoos for scar camouflage in patients with burn scars.

Methods:

A questionnaire was given to patient regarding their views about their scars, which camouflage techniques they knew about and which ones they had used before. Participants were then given the opportunity to select from a variety of designs and undergo a trial of wearing the water-transfer tattoo. Before and after photographs were taken. Participants were then asked to complete the rest of the questionnaire on their perceptions on the temporary tattoo and the usefulness and practicality.

Results:

This on-going research has so far shown positive results. We have determined the utility of water-transfer tattoos for scar camouflage in patients with various types of scars including burn scars. Participants found this camouflage technique cost-effective, quick, easy to use and an effective way of concealing their scars. We demonstrate the effectiveness of these water-transfer tattoos at achieving camouflage through photographs of case examples, showing a number of elaborate and interesting designs in different anatomical areas over scars.

Discussion:

Cosmetic tattoos are very popular in Western society with an estimated 10-20% of the European and American society having one. Cosmetic tattoos can be a means of scar camouflage. These tattoos can be permanent or temporary. Considering that permanent tattoos can be a big commitment to make, temporary water-transfer tattoos can serve as a temporising alternative for patients seeking scar camouflage for special occasions only for example. Furthermore although some patients get real tattoos and are happy, it is difficult to help other patients understand the potential benefits without trying first. A trial of temporary tattoo can play an important role in such cases.

Conclusions:

This adjunctive intervention may positively impact on patient's self-esteem. Further consideration is needed to make this scar camouflage option more accessible to patients.

Artificial intelligence in burn care: empowering non-experts to enhance scientific communication

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Introduction:

Artificial intelligence (AI) has the potential to revolutionize many fields, including burn care. However, non-experts in AI may struggle to effectively utilize its capabilities in their research and communication efforts.

Purpose of the study:

This study aims to explore the potential of AI in enhancing the productivity and effectiveness of non-experts in scientific communication, specifically in the field of burn care.

Methods:

A literature review was conducted to identify relevant AI techniques and tools for practical applications. An AI tool then compiled this entire abstract based on a written instruction: 'You are an academic researcher writing a scientific article abstract for presentation at a scientific meeting related to burn care. The format of the response should be in academic abstract style....in less than 500 words'

Results:

The literature review revealed that AI can be employed by non-experts in several ways to enhance the productivity and effectiveness of scientific communication, including: writing and summarizing text, automated literature review and data extraction, text summarization and generation, image and video creation, editing and analysis, predictive analytics and modelling, writing computer programmes and undertaking statistical analysis. All using free software and usually from a simple text prompt.

Discussion:

The results of this study demonstrate the immense potential of AI to empower non-experts in the field of burn care to enhance their scientific communication skills and productivity. A live demonstration will be presented to showcase the benefits of AI that anyone can use.

Conclusion:

AI has the potential to enhance the productivity and effectiveness of non-experts in scientific communication, specifically in the field of burn care. The live demonstration is expected to provide audience members with a tangible understanding of the benefits of AI in this context and inspire them to explore its potential in their own research and communication efforts. The astounding power and simplicity of AI tools using a simple text prompt is a ground-breaking and revolutionary advance which has resulted in a 1-million person userbase within the first five days of availability. No software in history including social media has attracted this level of users and it will and already is changing the world [author's final say, non-AI generated].

Carbon dioxide laser for precise and bloodless contouring of soft tissue ahead of skin grafting – a case example of technique and benefits

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Introduction:

Scarring is a dynamic process as a result of wound healing activity. Post-burn scars are often hypertrophic in nature and thus exhibit a much thicker and firmer scar, often leading to contractures and cosmetic deformities. Various reconstructive strategies have been implemented by burns surgeons to endeavour to mitigate and improve such symptoms and appearances. Laser therapy for scarring is an expanding area of interest within this field. Lasers are typically used for a variety of indications in a non-surgical setting. Currently the main use of Carbon dioxide (CO₂) laser within the NHS is targeted around scar resurfacing in the day-case setting as well as management of skin lesions. However, the high cost of lasers and limited expertise make their availability limited.

Purpose of the study:

We demonstrate the advantageous, intra-operative use of a CO₂ laser for precise contouring of a hypertrophic burn scar prior to skin graft reconstruction. This technique has not been previously described within the literature.

Methods:

We present the case of a 36 year-old female with hypertrophic scarring following a 65% TBSA flash flame burn, which involved the face. She was initially managed at another burns unit. She required long-term scar therapy after recovery. An area of hypertrophic scarring and contracture to her lower lip and chin was one of the areas of main concern for her. This area had been excised and grafted in the acute setting with secondary scar contracture release and full thickness skin graft (FTSG). Under our care, she had a trial of multiple sessions CO₂ laser resurfacing, with limited success. A decision was made to perform intra-operative CO₂ laser ablation of the scar and reconstruct with a FTSG. The CO₂ laser used in this way allowed us to contour the scar and underlying soft tissue precisely in a bloodless field, to regain a mentolabial angle before reconstruction with FTSG. A temporary intra-oral silicone prosthesis was used to allow for quilting of the graft at maximal stretch and to maintain this angle.

Results:

This approach provided a bloodless surgical field with re-establishment of the mentolabial angle in a way that would not have been possible with a knife. She healed well with full graft take, no post-operative complications and a favourable cosmetic outcome.

Conclusion:

We present the successful technique of using a CO₂ laser for scar contouring prior to grafting in the face. An appealing tool for burn surgeons, this approach allows precise handling of the laser beam in a bloodless field allowing visualisation to perform delicate and accurate contouring of tissues in cosmetically sensitive areas.

A cluster of frostbite cases at a regional burn centre - cause for concern and implications for prevention and public awareness

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Introduction:

Frostbite injury is the acute freezing of the skin or tissues. Frostbite results from exposure to cold temperatures that are low enough to cause crystallization within exposed tissue. This usually develops following exposure to temperatures under -2°C for over an hour. Hands and feet are the most commonly affected.

Following the spell of sub-zero temperature in the UK in December 2022 and January 2023 our burn centre experienced a cluster of frostbite injuries. Unlike thermal burns public awareness on prevention and first aid on frostbite injuries appears to be limited.

Purpose of study:

To highlight the incidence of frostbite cases over recent winter months, characteristics of injuries seen and our management of the cases.

Methodology:

We reviewed all cases of frostbite related to exposure to freezing weather admitted to the burns centre since the start of winter in 2022 to identify common themes, injury patterns, management and outcomes.

Discussion:

Three patients were admitted over a 2 month period of December and January. Patients were aged 32, 34 and 60. Two patients sustained frostbite injuries to bilateral soles of feet from walking barefoot for a prolonged period of time in the cold while inebriated, while the other patient sustained frost-bite to both hands while working as a bin-man in freezing temperature. Of the 2 patients with frostbite injuries to feet, one was treated conservatively while the other required multiple operations. The latter had a significant amount of debris including glass and stone, and skin and fat necrosis involving the anterior soles of his feet which required debridement (including debridement of part of 2 metatarsal heads). He required a 2-staged reconstruction with BTM and skin graft. He developed osteomyelitis and needed a long course of intravenous antibiotics. The patient with frostbite to hands required amputations of his left index, middle and ring fingers at various levels on the middle phalanx. He also had fingertip pulp necrosis on his right ring finger which was managed conservatively.

Conclusions:

Freezing temperatures result in excess burns from heat as a result of use of hot water bottles and increased use of a variety of heating methods. The occurrence of a cluster of frostbite injuries in such a short space of time raises the suspicion of lack of awareness amongst the public on frostbite from freezing temperatures. Burn public awareness tends to focus on heat-related injury but there may be a gap related to public awareness on frostbite. The BBA might want to consider public awareness related to frostbite during periods of freezing temperatures.

Novel use of Biodegradable Temporising Matrix (BTM) -Novosorb for the reconstruction of open abdomen treated at a burns centre

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Introduction:

Biodegradable temporising matrix (BTM) NovoSorb™ is a synthetic polyurethane used as dermal scaffold. Its use has been described in literature in a range of settings including burns and complex wounds. It displays robust handling characteristics, requires minimal wound care and is resistant to infections. It can be used to temporize large wounds in major burns, and to cover ungraftable wound beds, such as exposed bone or tendon. It has also been postulated to minimize the risk of scar contractures.

Open abdomen (OA), can be a complication of complex laparotomies. Several closure techniques are available where primary closure has failed; including Vacuum Assisted Closure (VAC) followed by application of split thickness skin graft (STSG) to granulating bowel. Without a dermal substitute interface between grafts and bowel, the outcome of this approach is often unstable grafts leading to development of enterocutaneous fistulae (ECF) which are even more complex to treat.

Our burn centre often admits patients with complex non-burn wounds including necrotising fasciitis for skin coverage.

Purpose of study:

We describe the novel use of BTM for reconstruction of an open abdomen. There are no published cases of BTM use in this setting.

Methods:

- 1) A comprehensive literature search was undertaken to identify cases of BTM use in management of open abdomen.
- 2) We present a case of a female patient with OA reconstructed using a 2-staged procedure with BTM and STSG. Patient management, surgical techniques, and final result at follow up are explained in detail.

Discussion:

A 51 year old female was referred from general surgery to our burns centre for reconstructive surgery to the abdomen following full thickness (FT) skin loss from an abdominal wall necrotising fasciitis secondary to a stercoral perforation. The recto-sigmoid stercoral perforation led to a faecal peritonitis which required multiple surgeries including an end colostomy. Following debridement of the necrotising fasciitis she had FT skin loss of 16% TBSA involving entire abdomen, flanks, proximal thighs and genitalia. Following the multiple abdominal washouts, she developed a dehiscence of the top half of the abdomen resulting in an OA, exposing a large segment of small bowel.

A staged reconstruction was done, initially with further debridement and VAC dressing; followed by sandwich graft of STSG and allograft to the abdominal wall and thighs and BTM to exposed bowel (plus VAC dressing). After 37 days the BTM was delaminated and STSG plus VAC applied. The patient had 100% graft take and was considered fully healed after 18 days. The skin graft showed a stable, robust, mobile quality, and was pliable and remained stable after 1 year of follow up.

Conclusion:

Our experience shows that a 2-staged reconstruction using BTM is an effective approach for reconstructing cases of open abdomen. Addition of the dermal matrix before grafting appears to offer stable and durable

bowel coverage without tethering, potentially preventing the development of fistulae. This is the first case report of BTM reconstruction of open abdomen providing a platform to support its consideration in treatment options for this complex problem.

Burning Hot: Analysis of Hot Water Bottle Burns in a regional burns centre

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Hot water bottles (HWB) are common household items used to aid in pain relief and to provide warmth. While popular, their use has been associated with debilitating and life changing burn injuries. With the current cost living crisis, more people are turning towards alternative methods of keeping warm in the winter, and the popularity of HWBs are rising.

In our regional burns facility, we have retrospectively reviewed burn injuries caused by HWBs to understand the nature, incidence and character of these burns with the aim to improve patient education and the safe use of HWB.

Patients who presented with a hot water bottle burn (HWBB) within a six-month period from January to June 2021 and compared with the same period in 2022 were identified and case notes were reviewed retrospectively. Information was obtained from the hospital's "burns pro forma", which was filled in on patients' presentation to hospital, and from telephone questionnaire.

Thirty-three patients identified and the case notes of twenty-three were available to be reviewed. Two patients were excluded as their burns were not from HWBs. Of the case noted reviewed, fourteen patients were able to be contacted by telephone. The ages of patients ranged from 21 to 71 and 74% of patients were female. The number of HWBBs doubled from 2021 to 2022. Total burn surface area (TBSA) ranged from 0.1% to 4% with 57.1% of burns covering more than 1% of TBSA. The most common depth of burn was superficial thickness (33.3%) and the least common was deep partial thickness (14.2%). Half of patients had used the HWB for analgesia, with reasons including menstrual pain, back pain and post-operative pain, and half of patients had used the HWB for warmth. The cause of the burn is as follows: burst bottle (50%), burn through direct contact to the bottle (28.6%), by spilling hot water whilst filling (14.3%) and spillage of hot water whilst putting the top on the bottle (7.1%). Of those who were burnt by the burst bottle, 42.9% had applied pressure to the bottle triggering the burst. 71.4% of had not used a cover whilst using their bottle. 78.6% of people used boiling hot water to fill the bottle.

Our study has also shown that HWBBs can affect a wide age range of patient population and can lead to significant injury. HWB Safety Standard BS 1970:2012 creates standards for the safe use of HWBs. It advises people do not use boiling hot water, to use a cover to protect the skin if there is prolonged use of the bottle and to avoid pressure to prevent bottle burst. Our study has shown that patients are using HWB in a manner which is considered unsafe and against guidelines. Our study has shown that the incidence of HWBBs has risen substantially from 2021 to 2022 which highlights the importance of improving patient education to aid in the prevention of burns in the future. Going forwards we would like to create a local public awareness campaign to achieve this.

The incidence of nitrous oxide burns and their management

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Introduction

Nitrous oxide, commonly known as laughing gas, can alter pain perception and result in deep burn injury that may require surgical management. Burns services across the world have seen an increase in deep cold burns following the use of nitrous oxide canisters. Here, we use common descriptors to comment on the burns referred with nitrous oxide listed as mechanism of injury, and their management.

Purpose of study

To determine how many patients referred sustained their burn through a nitrous oxide injury, and to use this data to promote legislation change to ban the sale of nitrous oxide to prevent the increasing incidence of these burns.

Methods

We reviewed data on patients referred to the burns unit who sustained a burn injury with nitrous oxide listed as mechanism of injury between January and December 2022. A total of 33 patients were identified within this time frame. Data on age, location of burn, total body surface area (TBSA), depth, management, time to healing (TTH) and complications was collated.

Results

A total of 33 patients were identified (18 Male; 15 Female). More detailed data was pulled on 28 of these patients. 17 referrals were seen on the burns unit. Mean age of those seen was 24.8 (range 16 to 41). Most common location of burn was inner thighs (35.3%), hands (35.3%), and fingers (35.3%). Mean TBSA of burn in those seen was 0.47 (range 0.1 to 1). Depth of burn was superficial in 1 patient, superficial partial thickness in 10 patients, mid-depth in 2 patients, deep dermal in 4 patients, and full thickness in 0 patients. 2 patients were surgically managed with direct closure (100%), and 0 with split thickness skin grafts. 50% of surgically managed patients sustained a deep dermal injury, and the remaining 50% sustained a mixed depth burn injury. 15 patients were managed conservatively with dressings; 10 patients (66.67%) had a superficial partial thickness burn. Mepilex AG (35.3%) was the most common single dressing used. Honey (17.6%) and Mepilex border (17.6%) were the most common combination dressings used, followed by TC (11.8%). Flaminol, Acticoat, Jelonet ED, Atrauman, and moisturiser were used less commonly. TTH data was available for 14 patients. Mean TTH was 9.4 days (range 7 to 30). Data was unavailable for 3 patients (2 did not attend follow up, and 1 TTH is still ongoing). 3 patients required scar therapy.

Conclusion

In our review, we demonstrate a high number of referred burns with nitrous oxide listed as mechanism of injury, many of which sustain a deep burn injury. Some of these burns require surgical management, and subsequent scar therapy. These burns are entirely preventable, and doing so would reduce significant risk to

health, and cost burden to the NHS. We recommend legislative change be implemented as a preventative measure urgently.

Delayed discharge - the non-burn factors that are making the 1 day per TBSA ratio so difficult to achieve

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Introduction

In our burns centre we have noted an increasing difficulty to discharge patients following burns when they are 'medically fit for discharge' (MFFD). Previous studies have commented on the relationship between mechanism of burn injury and length-of-stay (LOS) [1]. Here, we similarly demonstrate the impact of underlying medical factors on LOS, but also draw attention to non-burn related factors contributing to delayed discharge.

Purpose of study

To determine how many of our patients are meeting the well-established "one day per percent total body surface area (TBSA) burn LOS" [2]. To ascertain which factors (medical, social or other) predispose patients to requiring a longer inpatient stay than expected.

Methods

We reviewed all adult and paediatric admissions between September and December 2022 (n=107). 4 patients were excluded (non-burn skin loss or still an inpatient). We recorded the size of burn, LOS and examined electronic patient records for all patients that had a ratio of ≥ 5 for length of stay to TBSA to ascertain reasons for delayed discharge.

Results

There were 70 adult and 33 paediatric patients (63 M; 39 F; 1 Non-Binary) with a mean age of 35 (range 1 to 96), average TBSA burn of 5.6% (range 0.1 to 45) and average LOS of 9.3 (range 1 to 113). The mean ratio of LOS to TBSA burn was 5 (median 1.6) and 17 patients had a ratio of ≥ 5 (range 6 to 140). Electronic records of these patients demonstrated 6 patients with extended LOS due to infected burn, 5 due to delays in repatriation to parent hospital/appropriate medical facility, 1 awaiting inpatient transfer to medical team, 3 patients with additional medical investigation not related to burn injury, 1 patient requiring psychiatry inpatient placement and 1 with ongoing pain management needs. Patients aged ≥ 75 had relatively small burns (mean = 1.5 TBSA%), yet a significant portion of these had an extended LOS due to non-burns related factors.

Conclusion

In our review, infected burns were the most common cause for a protracted inpatient stay but rigorous infection control measures are already in place to ensure the chances of burn infection are minimised [3]. We also demonstrated that a large proportion of patients experience delayed discharges due to awaiting transfer to another hospital, or other suitable placement. These barriers to an expeditious discharge have been observed throughout the NHS and are a significant contributor to cost burden [4] and put an increased

pressure on regional and national burns networks. We propose potential solutions that include the consideration of a medical burns step-down unit or more cost-effective government spending in social care.

Improving burns patient mental wellbeing in the acute phase through a burns patient outcomes booklet

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Introduction

In the UK it is estimated that there are 250,000 burns injuries each year [1]. It is well known that there is significant trauma associated with a burn injury both long-term following discharge, but also in the acute phase [2]. The effect on mental wellbeing also extends to the families of burns patients [3]. Understandably, many patients worry about permanent scarring and lack the insight that the healthcare professionals treating them have from having seen so many similar burns progress and heal very well. Here, we propose that a patient outcomes booklet with photographs of similar burns is composed, with the aim to show the trajectory of a burn to ease the distress caused by a burn injury in the acute phase.

Purpose of study

To determine how many patients would find a patient outcomes booklet with photographs of similar burns useful to easing distress caused by burns injuries in the acute phase.

Methods

A questionnaire was used to collect data from patients with burns. Data on patient worry levels at the present time, in the weeks and months to come, and on scarring was obtained using a 10-point scale. Yes/no questions were used to determine if patients felt our intervention would be useful in mediating their distress at the present time.

Results

28 questionnaires were collected. Of these, 21 (75%) answered that they would find it helpful at the present time to see photos of similar burns. Of 28, 1 did not answer whether or not they were feeling confident that their burn would recover and heal. Of the remaining 27, 26 were confident their burn would recover and heal (0.96). 32% were not aware of the treatments available to them on the NHS should their injury scar. One patient did not answer as to whether or not they would feel better if they knew what treatments were available to them for scarring on the NHS. 96% of patients answered yes to feeling better if they knew what treatments were available to them for scarring on the NHS.

Conclusion

75% of respondents answered that they would find it helpful to see photos of similar burns to theirs that have progressed and healed. However, considerations should be made towards how this may impact patient experience and psychology, and further research and discussion within a multidisciplinary team is required prior to implementation.

Incidence and prognostic factors for amputations in adult burns patients: a 10-year retrospective study

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Introduction:

In severe burns, amputation is sometimes required to remove non-functional or dead tissue, therefore decreasing the risk of infection, and increasing healing potential and overall survival. There are currently no UK studies that assess incidence of or prognostic factors for amputations in adult burns patients. The aim of this study is to identify the incidence of amputations resulting from adult burns injuries and factors that influence the likelihood of amputation. Following amputation, patients may experience multiple physical and psychosocial problems; identifying potential risk factors may help reduce the incidence of amputations, and therefore reduce the incidence of these problems.

Methods:

This is a 10-year retrospective observational study of patients admitted to a UK adult burns centre between September 2012 and September 2022 who underwent an amputation following a burn. Data obtained included patient demographics, past medical and drug history, and information about the burn injury, amputation, and post-amputation outcomes. These were analysed to identify possible risk factors.

Results:

There were 2991 acute burns admissions during the time period specified, and 35 patients underwent at least one amputation, giving an amputation rate of 1.17%. These patients had a mean age of 48 years (standard deviation 17.9 years), 65.7% were male, and 67.7% identified their ethnicity as white British. The most common cause of burn was flame (62.9%), followed by contact (14.3%), scald (11.4%), and electrical and chemical (5.7% each). The median total body surface area burned was 24% (IQR 51%). There were 94 amputations between the 35 patients, with a median of 28 days (IQR 50) to the time of the first or only amputation, and a median of 2 amputations per patient (IQR 3). Amputation of a hand digit was the most common (72.3% of all amputations) with almost a quarter of these (23.5%) being proximal to the proximal interphalangeal joint. The next most common level of amputation was amputation of a toe (9.6%), followed by above knee amputation (7.5%). In almost all cases (80%), tissue non-viability was the reason for amputation. Other reasons included infection, scar contractures, iatrogenic injury, polytrauma, and emboli. There was 1 mortality amongst these patients. The median length of hospital stay was 67.5 days (IQR 86 days), and 67.6% of patients required revisional procedures to their amputation stump, with a median of 1 revisional procedure (IQR 2) per patient.

Conclusion:

Amputations amongst burns patients are a rare but serious complication, often incurring long hospital stays and further revisional procedures. This study found that white British and male patients undergo the most amputations, and flame burns are the most common cause of burn injury-related amputation. Amputations of the fingers are by far the most common, and this may lead to reduced function and quality of life in major burn survivors. Further study is needed of post-amputation recovery and outcomes, which were not well recorded in this patient cohort.

A Novel use for Novosorb® Biodegradable Temporising Matrix (BTM) in Complex Facial Soft Tissue Trauma

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Introduction

Traumatic facial soft tissue injuries are frequently encountered by the plastic surgeon, posing complex reconstructive problems in addressing long-term facial form and function.

Catastrophic injuries with exposed facial bones often warrant free-tissue transfer, but where contiguous injuries and/or contamination limit immediate or early vascularised tissue coverage, temporising measures must be considered.

Novosorb Biodegradable Temporising Matrix (BTM)[®] is a dermal substitute gaining traction as a novel strategy in staged complex wound reconstruction. Where donor sites are compromised or limited there is growing literature describing its utility in the plastic surgeons' armoury.

Case

We present the management of a complex facial trauma, sustained by an unrestrained 18-year-old female passenger during a high-speed road-traffic collision.

Avulsive skin loss of the lateral forehead and cheek sub-units proffered a complex reconstructive challenge following resuscitation, decontamination and debridement. A decision to temporise the wound with Novosorb[®] BTM whilst the patient was taken, allowing consideration of delayed surfacing with local or distant flaps. However, satisfactory soft tissue coverage was achieved in three stages using BTM and split thickness skin grafting during an 8-week inpatient admission and at 18 months the patient demonstrates stable, pain-free scarring without significant donor morbidity and acceptable contour and colour matching.

Discussion

The literature pertaining to the acute management and outcomes of patients with complex craniofacial soft tissue trauma describes an array of surgical approaches, likely consequential of the inherent heterogeneity of injuries and patient cohorts. In defects involving exposed facial bones, vascularised tissue is often the chosen 'rung' of the reconstructive ladder but may be compromised by complex defects, compromised donor sites or patient instability.

Whilst the role for dermal substitutes in this mechanism of injury is relatively scant in medical literature, we have identified a novel and effective role for this technology going forward.

Piloting a burns psychosocial training programme in the Occupied Palestinian Territories: preliminary evaluation data.

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Introduction

There is a significant difference in the outcomes of burn patients from low and middle-income countries (LMICs) compared to resource rich countries. The NGO Interburns works to deliver tailored training programmes in burn care within LMICs in order to decrease this disparity. In conjunction with Medical Aid for Palestinians (MAP), a needs assessment within burns services in the Occupied Palestinian Territories (OPT) highlighted the need for psychosocial training to support healthcare workers improve their management of burn patients. A specific training package was developed adapted from materials developed by Changing Faces UK.

Purpose of the study

The aim of this project was to pilot and evaluate a UK-developed psychosocial training programme with burns care staff working in the OPT.

Method

A two-day psychosocial training package was delivered to multidisciplinary burns care staff working in the West Bank and Gaza. Training was delivered once in each location and facilitated by two UK-based Clinical Psychologists working in conjunction with Interburns, alongside local psychological professionals who supported with facilitation and translation. Training content was predominantly case-based and comprehensive training manuals were provided in Arabic and English. Pre- and post-training questionnaires consisting of Likert scales and open-ended responses were developed to assess participants' awareness of burns psychosocial issues, confidence in management, as well as their overall experience of attending training. Participants were also asked to comment on any changes they may expect in their future clinical practice.

Results

71 burns care professionals attended the training (21 attendees in the West Bank and 50 in Gaza). The programme required adaptations in Gaza due to a last-minute reduction in the allocated training time from 2 days to 1.5 days. The majority of attendees were nurses (46.5%), followed by doctors/surgeons (26.7%), therapy staff (15.5%) and social workers (7%). Pre- and post-course questionnaires indicated an overall increase in attendees self-rated understanding of psychosocial issues post-burn injury and confidence in management. The majority of attendees (79.1%) rated the training as being highly useful and 82% indicated that they would be highly likely to recommend training to colleagues. Qualitative evaluation highlighted the importance of training providing a reflective multidisciplinary space for case discussion, understanding the patient experience and the importance staff wellbeing. UK facilitators reflected on the need to adapt training materials to fit the individual needs of each OPT location.

Conclusion

This pilot project highlights the importance of training in psychosocial care to burns care professionals in LMICs. Questionnaire results indicated that the training programme was valued, particularly in relation to

the space to discuss and reflect upon complex cases. Future work will consider additional adaptations to training and ways to increase access.

Frostbite injuries resulting from the recreational use of nitrous oxide, a cause for concern

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Introduction:

Nitrous oxide (N₂O) has a long history of recreational use in British society dating back to the 1800s. Various complications resulting from N₂O use have been highlighted in the literature including frostbite. A common method of recreational use of N₂O involves attaching N₂O cartridges to an empty whipped cream dispenser which releases the N₂O that may then be used to fill attached balloons. The dispenser is held between users' thighs during the filling process. N₂O vaporisation results in a temperature of -55°C, which can rapidly cause frostbite when dispensers are in contact with skin.

Global statistics indicate an increase in the recreational use of N₂O. Conversely, statistics in the UK show that there has been a decrease in the recreational use of N₂O from 8.7% to 3.9% in people aged 16-24 when comparing the frequency during the year of March 2020-2021 to July 2021-2022. A ban on the possession and sale of N₂O is currently under debate in the UK. Despite the downward trend in the prevalence of N₂O use in the UK, our regional burns centre has had 5 cases of full thickness frostbite injuries secondary to recreational use of nitrous oxide in the past 2 years, all of which required at least one surgical intervention. This is an increase compared with minimal to no prevalence in previous years.

Purpose of study:

We highlight the recent trend in frostbite injuries resulting from the recreational use of nitrous oxide. We describe patient demographics, severity of the injuries and the challenges in the management of these cases.

Methods:

A retrospective search of the burns database was carried out for patients attending our burns centre with frostbite injury secondary to recreational use of nitrous oxide in the period between January 2021 and January 2023.

Results/Discussion:

5 patients fit the criteria for frostbite injury secondary to N₂O use. The age range was 19-41 years and 3 were male. Four of the patients presented with similar injury patterns; full thickness (FT) wounds on bilateral medial upper thighs, while the fifth patient presented with FT injury to 2 digits, face and medial knees. The total body surface area (TBSA) injury in this group of patients ranged from 0.5-0.75%. All 5 patients required surgery, 4 of whom required skin grafts and/or excision and direct closure. The patient with frostbite to fingers underwent terminalisation of a digit due to mummification. This patient also required negative pressure wound therapy (NPWT) and long-term dressings for deep wounds over his knees. One female patient underwent a total of 3 scar revisions for unsightly skin graft scars.

Conclusion:

Our case series highlights a potential increase in the incidence of frostbite injuries related to recreational use of nitrous oxide. The injury severity may not be obvious initially which can lead to suboptimal first aid and delayed presentation. Patients may require multiple surgical interventions and long-term wound care

or scar management following complications. Increased public awareness of injuries from recreational use of nitrous oxide could deter users.

Handheld ultrasound in preference over C-arm for buried surgical staple removal

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Surgical skin closure staples are commonly used in our practice to secure autografts to post excision burn wounds. Our typical practice is to remove these staples between 2 and 7 days after insertion. Despite best efforts, we occasionally see retained surgical staples in healed burn wounds. This may commonly necessitate surgical removal in theatre with X-ray image intensifier guidance.

Ultrasound use has increased exponentially over the last 20 years as the technology has advanced and machines have become more readily available and easier to use, bringing them into the reach of the non-specialist. The orientation and the depth of the staple is easily assessed using the mono-planar nature of the ultrasound probe. The site for optimal incision can be identified by using the ultrasound probe markings to triangulate the exact location of the staple. It is easy to perform this technique as a single operator and the dynamic nature of ultrasound allows for continuous assessment and adjustment of position during the procedure. This, compared to the 'stop-start' nature of X-ray guidance improves economy of movement and efficiency, as well as maintaining sterility.

In our opinion, where an ultrasound machine is available, it should be the preferred method of buried surgical staple removal over an image intensifier. Although there is an initial learning curve to effectively use the ultrasound machine, most clinicians would be able to perform this technique accurately with a short introductory training. In this poster we present a pictorial guide demonstrating this technique using a Sonosite Edge II ultrasound machine.

Frostbite injury from recreational use of nitrous oxide canisters – not a laughing matter

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Introduction:

Nitrous oxide (laughing gas) is known to be used as a recreational drug. Contact frostbite injury from the compressed gas canisters has previously been described in the literature but, as a busy regional burns centre, an increased number of such cases has been noted. The pattern of injury from this mechanism has been noted to present similarly between patients. This study presents a case series of frostbite injury associated with nitrous oxide misuse over a 12 month period.

Methods:

A single centre prospective case series of all patients referred and treated for frostbite injury secondary to misuse of nitrous oxide compressed gas canisters between January 2022 and December 2022 was performed. Data collection was performed through a referral database (TRIPS) and patient case notes.

Results:

Sixteen patients satisfied the inclusion criteria for this case series. The group consisted of seven male and nine female patients. The mean patient age was 22.5 years (range 15-29 years). The median TBSA was 1% (range 0.1 – 2%). 50% of patients in the cohort had a delayed initial presentation to A&E for greater than five days. Eleven patients were reviewed at our burns centre for further assessment and management. Five patients were managed conservatively at the referring A+E.

In total, 11 patients had bilateral inner thigh frostbite injury. Eight patients had a necrotic full thickness burn, including subcutaneous fat. Seven patients were reviewed at our burns centre and offered excision and split thickness skin graft. Three declined surgery and were managed conservatively.

Four patients presented with contact frostbite injury to the non-dominant hand and one patient was referred for frostbite injury to the lower lip and vermillion. This subgroup were managed successfully with conservative management alone.

Conclusion:

The reproducible pattern of frostbite injury secondary to the abuse of nitrous oxide compressed gas canisters is demonstrated in our case series. The distinct pattern of mechanism of injury, patient cohort and anatomical area of injury presents an opportunity for targeted public health intervention in the affected group.

First web space contractures: a simple and patient-friendly classification system

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Background: First webspace contractures represent a significant sequelae of hand burns and can have a significant impact on hand function. At present there is no agreed consensus on how to best classify its severity. Looking to establish a clear universal descriptor, we present a functional classification system for first web space contractures.

Method: Our proposed classification system uses a functional element of what a patient can grasp in their first webspace: a tumbler, a pint glass, an espresso cup or a flute. To validate our classification, a range of healthy volunteers had their first web spaces assessed by measuring their palmar and radial abduction. To illustrate our new classification system, we also present a case series of three patients with varying severities and aetiologies of first web space contractures.

Results: In 30 healthy volunteers, the mean average palmar abduction and radial abduction was 79.4 mm and 63.7°, respectively. 90% of volunteers were able to hold a tumbler with both hands.

Conclusion: This classification system is a simple and real-world descriptor that uses common household objects. This facilitates patient-clinician communication and helps patients understand the functional limitations of their contracture. Furthermore, it provides a practical and visual tool to assess improvement following hand therapy or surgical management of contractures.

Necrotic arachnidism - not so incy wincy spiders

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Spider bites are rarely reported in the United Kingdom. Most are classified as generic insect stings and treated as such. Patients do not usually present to plastic surgical services until the onset of complications such as ulceration or infection.

We present a series of necrotic wounds that have the typical appearance of spider bites, as commonly reported in other countries. We also present our experience in managing these injuries.

We review the literature regarding mechanism, diagnosis, and treatment.

We hypothesize that these are due to increasing presence of certain spider species, and that climate change may be a contributory factor.

Deep dermal burn sustained from operative lighting

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Introduction: Surgical luminance (also known as operative lighting) allows for adequate visualisation of the operative field, a necessity for delivering safe surgery. Light-emitting diode (LED) surgical luminance systems are widely used in modern medicine.

We present a case of a 59-year-old male patient who sustained an iatrogenic burn from operative lights during an emergency vascular bypass revision procedure. According to the author's literature review, this is the first documented case of a burn of this nature to be reported in the United Kingdom.

Aim/ Purpose of the report: This report highlights an unusual mechanism of sustaining a cutaneous burn intra-operatively by LED lighting. We aim to highlight a potential safety hazard related to using standard operative lighting equipment.

Methods: We present a thorough review of the patient's progression from the point of injury to definitive treatment, including follow-up.

Discussion: In this case report, we conclude that the surgical operative lights caused the burn. The burn was a mixed depth, deep-dermal and partial-thickness burn in the suprapubic area that was exposed to the operative lights. This required surgical excision and reconstruction with a split-thickness skin graft which healed well with 100% graft take.

Conclusion: Operating lights, although regarded safe, have the potential to cause significant cutaneous injury. Increased awareness and education are required to ensure safe practices.

Comorbidities in the prognostication of major burn patients: A data-set of over 1000 patients from 54 burn centres, worldwide.

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Introduction: Management of severe burns is resource intensive and clinically challenging. It is very useful to be able to prognosticate patients upon admission to burn centres to aid decisions around stratifying the level of care, the appropriate counselling of patients and family members and for the appropriate decisions on active treatment versus comfort care. It also aids in mortality review processes. Several prognostication systems have been devised for burns. The most well-known and commonly used are the Baux score and the revised Baux (R-Baux). Other scores such as the APACHE II and Charlson Comorbidity Index (CCI) have been validated for estimation of general ICU mortality but were not devised specifically for use in burns. Comorbidity is deemed a main determinant of ICU outcome. The applicability of comorbidities to predict survival in major burns remains undetermined.

Purpose of the study: (1) to identify individual comorbidities predictive of 3-month mortality from major burn injuries; (2) to evaluate the predictive strength of the Baux, APACHE II and CCI in major burns.

Methods: We used the RE-ENERGIZE[®] clinical trial dataset (the largest international dataset on major burns). Primary outcome was 3-month mortality. Logistic regression analyses were performed to identify factors predicting outcome.

Results: Following removal of patients who were lost to follow-up or withdrew consent, a total of 1116 patients were included. Median age was 50 (Inter-quartile range [IQR] 34-64) years. Median TBSA% was 29 (IQR 20.3-41), median Baux was 82 (IQR 68-95), while median APACHE II score on admission was 13 (IQR 8-20). Median CCI was 0 (IQR 0-1, range 0-13), with 57.8% of patients presenting with at least one comorbidity. Three-month mortality was 15.41% (n=172). Following confirmation of significant predictors upon univariate logistic regression, multivariate analysis adjusted for age confirmed the strength of the TBSA% (p=0.000, Odds Ratio [OR]=1.07, 95% Confidence Interval [CI]=1.05-1.08) and Baux (p=0.000, OR=1.06, CI=1.05-1.08) in predicting 3-month mortality. The strength of the APACHEII score at univariate analysis (p=0.014, OR=1.03, CI=1.01-1.05), was lost when adjusting for TBSA (p=0.014, OR=1.03, CI=1.01-1.05). In the multivariate model, CCI showed similar predictive power to that of the other systems (p=0.031, OR=1.18, CI=1.01-1.36), with a 18% increase in mortality with every incremental increase in CCI. The presence of vascular (hypertension, peripheral vascular disease or cerebrovascular disease) (n=354) (p=0.012, OR=1.73, CI=1.13-2.64) and pulmonary (COPD or Asthma) (n=107) comorbidities, (p=0.024, OR=1.93, CI=1.09-3.41), specifically hypertension (n=298) (P=0.035, OR=1.60, CI=1.03-2.47) and COPD (n=55) (P=0.023, OR=2.26, CI=1.12-4.54), were strong predictors of mortality. Cardiac, endocrine, gastrointestinal, musculoskeletal and psychological comorbidities, or pre-existing malignancy had no impact on outcome.

Conclusion: We identified the comorbidities most strongly associated with 3-month mortality; vascular and pulmonary comorbidities, particularly COPD and hypertension. We re-confirmed the strength of the Baux in predicting mortality but also demonstrated the power of the CCI. Unfortunately, we were unable to compare the strength of these with the R-Baux due to lack of inhalation injury data. Further research should focus on the importance of comorbidities and look to combine the most significant mortality predictors into a new burns-specific prognostication tool.

The development of burns major incident condition cards for non-burns therapists

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Introduction

A major incident is any occurrence that presents a serious threat to the health of the community, or causes such numbers of types of casualties as to require special arrangements to be implemented. In the event of a burns mass casualty incident in the UK, the Concept of Operations for the management of mass casualties: Burns annex (2021) would be implemented. Due to the very small number of specialised burns services within the UK, it is likely that patients with burn injuries may be retained in non-specialised services until an appropriate burns bed is found, being looked after by staff with little or no knowledge of burn care. High-quality, hyper-acute rehabilitation methods can support the major incident response and optimise patient outcomes (Clinical Guidelines for Use in a Major Incident, 2020). Research has also shown that early initiation of correct limb positioning, splinting, and mobilisation have a positive impact on the subsequent development of contractures in burns patients, and as such leads to better long-term functional outcomes (Puri, Shrotriya & Bachhav, 2019). It was therefore of concern to the burns therapists within our network that these important days of early rehabilitation had the potential to be missed in the aftermath of a major incident occurring and negatively affect long-term functional outcomes.

Purpose

Burns Major Incident Condition Cards were designed and produced as an easily accessible resource that non-burns therapists could refer to in the event of a burns mass-casualty incident, to guide them in their early management of burn-injured patients and ensure optimal long-term functional outcomes.

Method

A literature search was conducted to ensure that the condition cards were evidence-based and where there was an absence of conclusive evidence, consensus agreement was sought from the wider national BBA Burns Therapy Special Interest Group (SIG). The cards have subsequently been approved by our Network Board, the BBA Burns Therapy SIG, and the National Emergency Preparedness Resilience and Response CRG. They have been cascaded via our network manager to the national critical care networks, RCN critical care network, and the Chartered Society of Physiotherapy, and the Royal College of Occupational Therapists, for the information of their members.

Results/ Discussion/ Conclusion

The Burns Major Incident Condition Cards are now available to access freely via the Network website so that in the event of a burns mass casualty incident, non-specialist therapists treating burns patients have access to evidence-based guidelines. They will be reviewed and updated where necessary by our network therapists on an annual basis to ensure that they continue to comply with the current evidence base.

Reaudit of compliance with best practice guidance on responsible opioid prescribing in burns patients

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Introduction

Opioids play a major role in analgesia following burn injury. Misuse, addiction and death are unfortunate complications of prescription opioid misuse. An audit reviewing opioid prescribing practices at discharge from St Andrews Centre for plastics surgery and burns, Essex, UK in 2019 showed opioid prescribing practices and documentation at discharge planning can be improved. A multidisciplinary working group identified key areas for improvement and designed and implemented service improvement action plans to improve opioid governance, addressing standards of care against national resources.

Strategies included introducing a tailored 'Patient Information leaflet' (PIL) about analgesia for burn injuries, daily review of opioid prescriptions and newly introduced functional pain scores to wean analgesia appropriately, communication with the GP to prevent duplication of prescriptions, completing a 'weaning plan' to engage and educate the patient and to communicate with the outpatient clinic and GP, and introduction of a quarterly pain clinic to help manage patients with ongoing issues. A training package was created to educate staff regarding new interventions.

Objective

Reaudit opioid prescribing practices at discharge by assessing compliance with newly implemented strategies.

Methods

With hospital audit committee approval, 137 patient records of all adult patients discharged on opioids from February 15th to June 6th, 2021 were systematically analysed retrospectively.

Results

Ten records were excluded. 18 patients (14.6%) were discharged on opioids compared to 26 (25.2%) in 2019 ($p=0.435$).

We excluded patients discharged on 'over the counter' opioids (eg. codeine). Ten patients (7.87%) were discharged on 'strong opioids' compared with 17 (17.5%) in 2019 ($p=0.026$). Three patients were discharged on short-acting opioids only, three with long-acting opioids only and four with a combination.

All records showed good compliance to standards in 1. weaning analgesia daily (100%), 2. Functional pain score assessment (100%), 3. Stopping weaning 24 hours prior to discharge (100%) and 4. Providing the PIL (80%). One patient is followed up at the quarterly pain clinic.

Only 40% had completed weaning plans and documented instructions for the GP. Only two had discharge letters from the outpatients' clinic.

Discussion

The number of patients discharged on strong opioids have reduced significantly. Opioids were reviewed and weaned appropriately.

80% of patients were given the PIL, which allows management of patient expectations and increases awareness of risk.

We need to improve communication with the patient and GP to reduce duplication of prescriptions and improve patient engagement. Turnover of staff causing reduced awareness of the opioid governance pathway may have led to incorrect documentation, or filing and paucity of data.

Patients should be weaned from long-acting opioids to short-acting opioids. 30% were prescribed a long-acting opioids only, which may have been prevented by completing the weaning plan with multidisciplinary input.

Conclusions/ Recommendations

Overall, there is a significant improvement in responsible prescription of opioids.

We recommend continued education of all staff about the opioid governance pathway. We will continue to review and update practices to improve opioid governance.

An audit of burn injuries caused by hot water bottles presenting to a regional burns centre

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Introduction:

Hot water bottles have been a common household item in the UK for decades. In winter 2022 several department stores reported that sales of hot water bottles were significantly increased compared to previous years and some suggest that this may be linked to the cost of living crisis and increased domestic heating prices. Hot water bottle usage can be associated with burn injuries through prolonged contact with the skin or equipment failure through bursting or leaking.

Purpose of the study:

The aim of this study is to review all burn injuries caused by hot water bottles over the course of a year, with a view to reducing the annual incidence of hot water bottle burns. We aim to do this by increasing public awareness and utilising social media to promote safe hot water bottle use and burns first aid.

Methods:

A retrospective review of the burns database was conducted to identify all burn injuries resulting from hot water bottles presenting to a regional burns centre from January 2022 to December 2022. Case notes were reviewed to identify patient demographics, TBSA (total body surface area), site of burn and surgical intervention.

As a public health intervention, the burns team developed a short video promoting safe use of hot water bottles and burns first aid. This video was circulated on TikTok and currently has 174, 700 views.

Results:

A total of 214 patients were included in this study. 144 patients (67.3%) were female and 70 (32.7%) were male. Ages ranged from 1 to 100 years with a mean age of 37.2 years. 50 patients (23.4%) were children. The majority of injuries affected the lower limbs. TBSA ranged from 0.1% to 8% with a mean of 1.3%. 28 cases (13.1%) required surgery for excision and debridement of burns and 8 cases required more than one surgical intervention. One patient required amputation of the great toe.

Conclusion:

Hot water bottles are a significant cause of burn injuries and increased public awareness surrounding safe hot water bottle use and first aid has the potential to reduce future injury and protect the general public, as well as reducing the resource burden on the NHS. Given the current climate in which people are increasingly trying to save on energy bills, now is the time for targeted public health promotion, as we have produced with our social media video.

Improving the transition pathway from paediatric to adult burns care at Chelsea and Westminster Hospital (CWH)

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Introduction

Burns can require long-term treatment for functional, aesthetic, and psychosocial complications including mobility, scarring and post-traumatic stress disorder. Around the age of 12-16, paediatric burns patients transition to adult services, changing multidisciplinary teams (MDT) and taking on responsibility for their care. Studies have reported that a lack of support during this period can impact patients' well-being and quality of care. Therefore, effort should be invested to ensure consistency of care during and post this transition.

No formal transition pathway currently exists at CWH. Understanding the specific needs of transitioning paediatric burn patients at CWH could help to guide the development of an effective pathway.

Purpose

To assess the current pathway of the paediatric-to-adult transition service for burns patients at CWH.

To design a set of recommendations that incorporate our findings to enhance patient satisfaction and quality of care as they enter adult services.

Methods

Firstly, our team identified paediatric burn outpatients aged 12-16 years from December 2021 to February 2023. This data was obtained from the CWH computer system, Cerner, and recorded in Excel. We identified patients who are likely to transition to adult services and their specific treatment requirements.

Secondly, our team researched national transition guidelines. We also took guidance from successful transition programmes in Manchester University NHS Foundation Trust and University Hospital Southampton NHS Trust (UHSFT).

Finally, our team organised meetings with key stakeholders within CWH including burn therapies, psychology, and paediatrics. To ensure patient and public voice partners (PPV) were involved we spoke to the Children's Burns Trust and parents of transitioning children. The updated pathway was designed to ensure equality, diversity, and inclusivity.

Discussion

Of 121 paediatric outpatients between the age of 12-16, 19 patients require ongoing care. Of these, 11 are being seen by burns therapies including micro-needling, laser and scar management. It is likely that 6 will require further follow-up in the adult unit.

Interviews with key stakeholders identified the need for a named key worker, annual reviews, and a formal pathway as important aspects to include in the guidelines. They highlighted a lack of communication between departments and a lack of patient voice as shortcomings.

NICE guidelines outlined steps to a successful transition that we have incorporated into our document. Their guidance recommends: making a formal transition plan, appointing a named worker, annually reviewing transition plans, building patient independence, and familiarising patients with their new team. Useful information was also obtained from the UHSFT programme, Ready Steady Go, which empowers young patients to understand their condition.

Conclusion

To form a clear transition pathway, the specific requirements of the population, concerns of key stakeholders and national guidance must be considered. The formal transition pathway of paediatric-to-adult care for burns should include a named worker, annual reviews, and greater input from PPV.

We aim to reassess the patients after transitioning to assess if our guidelines have improved patients' satisfaction with the transition pathway. This study can be used to guide other burn units in the development of paediatric-to-adult transition pathways.

The prognostic role of frailty scoring in assessing patients with Stevens-Johnson syndrome and toxic epidermal necrolysis

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¹The Mid Yorkshire Hospitals NHS Trust

Introduction

Stevens-Johnson syndrome and toxic epidermal necrolysis (SJS / TENS) are acute skin reactions characterised by sheet-like skin and mucosal shedding, usually due to medication reactions. SCORTEN is a validated prognostic tool for outcomes in these patients. Age is one component of this and increasing age is known to be correlated with increasing risk of frailty. In other conditions frailty has been shown to be a predictor of mortality and morbidity, including in conditions with skin failure such as thermal burns.

The Rockwood Clinical Frailty Score is a widely used standardised tool to assess frailty. Although intended for use in over 65s there is evidence supporting its use in younger populations. Retrospective classification from thorough analysis of medical notes is a previously validated approach.

Purpose of the Study

We sought to analyse our cohort of patients to see if frailty score correlated with outcome measures and whether this represents a useful tool in patients with SJS / TENS.

Methods

Adult patients were identified from an existing, prospectively maintained database of patients with SJS / TENS. Electronic copies of contemporaneously made notes were analysed separately by two clinicians (one from a Plastic Surgery and one from ICU background). Each patient was scored by both using the Rockwood Clinical Frailty Score based on their documented premorbid function. Assessors were blinded to the other assessors' score. Interobserver reliability was assessed with Spearman's Rank Correlation Coefficient. The primary outcome was mortality. Length of stay for survivors and time to mortality were secondary outcome measures.

Results / Discussion

We identified a total of 26 patients treated for SJS / TENS in our Regional Burns Centre over an 18-year period. Of these 14 survived and 12 died. Only one had a contemporaneous frailty score (this matched the assigned score). Body surface area involvement varied from 8 to 95%. There was good interobserver agreement of retrospective frailty scoring ($p = 0.965$) with no score differing by more than one grade. In all cases where scores varied the Plastic Surgery assessment was of lower frailty than the ICU assessment. Patients who did not survive the episode had a higher median frailty score (4 vs 2.5, $p < 0.05$) and a higher median SCORTEN (3 vs 1). Although the mean age in the group that died was higher, this difference wasn't statistically significant. For those patients who died there was a moderately strong negative correlation between frailty score and time until death ($p = -0.456$). There was no observed correlation between frailty score and length of stay in surviving patients.

Conclusions

Our work demonstrates the potential usefulness of frailty scoring in patients with a diagnosis of SJS / TENS. We believe that services managing patients with TENS / SJS should be routinely recording frailty scores on admission. Although we do not believe that these scores alone should be used to make decisions on

treatment, they may be useful in helping to identify those patients with a poorer prognosis to help support decision making. This will also facilitate further research.

Observational analysis on the use of ketamine in major burn injuries in a specialist burn centre intensive care unit.

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Introduction

Care for patients with major burns in the intensive care unit presents many challenges. Burn injuries are painful and appropriate analgesia, anxiolysis and sedation is required for humanitarian reasons; to facilitate optimum care including necessary interventions; and to optimise long term psychological outcomes. Patients with major burns often require large doses of opioids, putting them at risk of adverse effects during admissions which may be prolonged. International guidelines suggest that a multi-modal, individual approach to analgesia should be adopted including the use of non-opioid medicines. Ketamine is an N-methyl-D-aspartate antagonist with analgesic and dissociative effects. It has been used for patients for major burns to facilitate dressing changes, for post-operative pain and at low dose by infusion for patients to reduce opioid requirements and to prevent neuropathic pain.

Study purpose

We conducted an audit of the use of ketamine for patients with major burns at Glasgow Royal Infirmary Intensive Care Unit (GRI ICU), a specialist burns centre, to establish current practice and examine the effect of ketamine on opioid requirements.

Methods

A continuous series of 14 patients admitted between September 2019 and December 2021 was identified. Relevant data were extracted from IntelliSpace Critical Care and Anaesthesia. Data for every administration of opioids for each patient were converted to Oral Morphine Equivalents (OME) for analysis. Data for 30 days from admission were analysed using interrupted time series analysis, using the day of initiation of ketamine to define time periods.

Results

7 of the 14 patients were given ketamine during admission. Median day of initiation was 4 (IQR 3,4). Ketamine was administered by intravenous infusion with a median dose of 0.32mg/kg/hour (IQR 0.19,0.48), the median duration of infusion was 5 days (IQR 2, 17). OME increased by 10.8mg/day in the pre-ketamine period (95% CI, -46.3, 67.9) $p=0.71$; on the day of initiation there was a further increase of 35.1mg/day (95% CI, -122.2, 192.4) $p=0.66$; in the period after initiation there was a decrease of 25.6mg/day (95%CI, -90.2, 39.1) $p=0.4$. The choice of opioid patients received showed heterogeneity, all patients received at least two opioids and the median OME per day was 327mg (IQR 129, 557).

Discussion

The decision to initiate ketamine is multi-factorial and takes account of the overall clinical picture including levels of pain and sedation, the presence of analgesia and hemodynamics. Therefore, there may be confounding factors which affect: the selection of patients for ketamine therapy; the timing of initiation; and the response in terms of ongoing opioid requirements. As the data did not reach significance, we conclude that the use of opioids was not affected by the initiation of ketamine in our data. We believe that further investigation into the stated factors affecting ketamine use and response is required. Standardisation of opioid regimens and decision-making tools to prompt early consideration of ketamine for suitable patients should also be explored further.

Conclusion

In patients with major burns admitted to intensive care no opioid sparing effect of the use of ketamine was demonstrated.

Hypothermia is associated with an increased mortality risk in severely burned patients: a retrospective review

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Introduction

Burn injuries are common and account for 180,000 annual deaths worldwide. Hypothermia is a common occurrence in the burn population, with the incidence varying between 42-62.9%. Hypothermia is known to have adverse effects in generalised trauma patients including increased morbidity and mortality. The effect of hypothermia specifically in the burns population is currently limited.

This study aimed to delineate associations between hypothermia and mortality in patients admitted to a regional Burns Centre.

Methods

This retrospective review used an existing database from a single regional Burns centre. All individuals admitted after sustaining total body surface area (TBSA) burns >15% from January 2015 to December 2020 were included. Patient demographic data was extracted from medical records and burns specific data including type of injury, TBSA and length of hospital stay was also collected. Patients were divided into groups according to their core temperature on admission. Normothermia was defined as core temperature >36.0 oC. The hypothermic group (temperature <36.0°C) was further subdivided into two groups of mild hypothermia (core temperature 34.5-35.9 oC) and severe hypothermia (core temperature <34.5oC). All data was assessed for normality. For statistical testing, t test and Pearson chi squared tests were used. Statistical significance was defined by p<0.05.

Results

A total of 2294 patients were admitted between January 2015 to December 2020. 1148 were excluded due to missing core temperatures and a further 829 were excluded as they experienced a burn injury with a TBSA<15%. 317 individuals were included in the final review with a mean (SD) age of 44 (19) years and an average TBSA of 33 (22)%. 52 individuals were found to be hypothermic on admission with 40 (77%) having mild hypothermia and 12 (23%) having severe hypothermia. The mortality rate varied between groups with the highest mortality rate of 67% in the severely hypothermic group and a rate of 15% in the mild hypothermic group and 3% in the normothermic group. The differences in the number of deaths in each temperature group were noted as being statistically different.

Conclusion

Hypothermia on admission is a common occurrence in those suffering from severe burns. Admission hypothermia is significantly associated with increased mortality in these individuals. More efforts should be targeted at reducing the incidence of admission hypothermia in this population and subsequently reducing risk of mortality.

Dwelling On A Recent Spate of House Fires: Investigating Incidence and Common Themes

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¹*Mersey Burns Centre*

Background

House fires pose a significant threat to life, property and can cause significant injuries. Our centre has seen a number of such injuries between November 2022 and January 2023. This is despite a yearly decrease nationally in incidence of dwelling fires.

Purpose of Study

This paper outlines the recent incidents of dwelling fires seen at our centre, their suspected cause and the subsequent impact on the residents. In addition, we aimed to examine the trend and characteristics of house fires in preceding years.

Methods

Retrospective note analysis of patients admitted with injuries sustained in house/dwelling fires in the last three years (2019-2022) was performed alongside data from the International Burns Injury Database to examine incidence within the area covered by our centre. Seasonal trends were assessed, particularly between November (Nov) and January (Jan) each year, and the characteristics and outcomes for patients in each incident assessed.

Results

Within our unit, we have noted 6 incidents of dwelling fires that occurred between 29/11/22 and 26/01/23 with 10 involved individuals and 7 deaths. Mean total body surface area (TBSA) of cutaneous burn was 41% (range 1.5%-75%.

This was a notable increase in incidence compared to previous years within the same months (Nov 2021-Jan 2022 - no incidents/deaths, Nov 2020-Jan 2021- 2 incidents with 2 patients, no deaths, Nov 2019-Jan 2020 - 4 incidents with 4 patients, 2 deaths).

Within this most recent period (Nov 2022-Jan 2023) 6 patients went into cardiac arrest at the scene before transfer to the Emergency Department (ED) or Intensive Care (ITU). All 6 sustained an inhalation injury (SII).

Of these 6 patients, 2 died in ED. 1 patient died in an external ITU after being diagnosed with hypoxic brain injury. The remaining 3 underwent surgery however they did not survive their injuries. Commonality between these 3 patients besides SII was that they were hypothermic and had a cardiac arrest either on scene or prior to transfer.

Causes were cited as being due to a lithium battery fire (scooter battery being charged), a lit cigarette being dropped whilst the patient was asleep, throwing petrol on an indoor fireplace and another electrical cause, yet to be determined. The cause remains unknown in 2 cases.

It was noted that in the last 3 years at our unit there have been 34 individuals involved in 26 incidents. During that total timeframe there have been 11 deaths. The number of incidents between November and January came to 12, almost half of the total.

Conclusion

It is notable that 6 deaths in our region occurred within a three month period, over 50% higher than the preceding 3 years. Noteworthy are the common factors between the patients that died and a lithium battery fire causing one incident. There may be further research plus safety and health promotion/prevention work in this arena.

Experience of Complex Burn Reconstruction With Novosorb Biodegradable Temporizing Matrix - A Series of 14 Patients

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Introduction

Despite advances in reconstructive surgery for burns and plastic surgery, complex cases can pose a significant challenge. Novosorb Biodegradable Temporizing Matrix (BTM) offers a solution for reconstruction of some wounds where alternative options are limited or less desirable.

Purpose of Study

This study describes the clinical outcomes of using BTM in the management of complex burn and non-burn wounds.

Methods

A retrospective case note analysis was conducted to evaluate the use of BTM in 14 patients over a 2-year period from early 2021 to 2023. Patients were monitored and photographed before, during, and after the surgery, and factors such as anatomical location and graft take were assessed.

Results

BTM was used to reconstruct 18 discrete areas in 14 patients, with 5 patients having a TBSA greater than 15%. One patient had necrotizing fasciitis, while the rest had burn injuries, including one frostbite. TBSA ranged from 0.4% to 65%. Except for three patients, all wounds healed fully. Two patients died before split skin grafting (SSG) could be applied, one was poorly compliant, leading to BTM breakdown, and the third had severe peripheral vascular disease, resulting in a toe amputation due to inadequate healing. The mean time to SSG was 39 days (range 21-65).

8 areas were healed via SSG, while 6 areas were able to heal through secondary intention and re-epithelialization of the BTM itself without grafting.

Two cases were particularly noteworthy. In the first, a 35-year-old female patient who sustained an electrical burn and lost significant tissue from her mid-back was reconstructed using BTM. The right latissimus dorsi muscle was completely lost, along with most of the left latissimus dorsi. The BTM was applied 36 days after injury and 95% of the graft took, with the remaining 5% healing fully through secondary intention. (Fig 1 - a) Wound after full debridement. b) BTM after application c) Application of 1.5:1 meshed SSG to delaminated, healthy granulated BTM wound base. d) Result of complete healing)

In the second case, a 51-year-old man who sustained 23% flame burns to both legs and feet, along with multiple other injuries from a road traffic collision, was treated with BTM. He had an open left talar fracture that was managed with an external fixation device. The BTM was applied over the fracture site after initial burn debridement and grafted 33 days later. Despite this devastating injury, no osteomyelitis occurred post-application or after the BTM grafting, and the patient went on to have open reduction internal fixation of the talar fracture with no complications.

Conclusion

This case series highlights the outcomes after BTM use in complex wound reconstruction, especially for burn cases. Our general outcomes and experience was positive.

Weighing In on Burns Recovery: The Value of Accurate Patient Weight Measurements

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Introduction

Accurate assessment of burns patients is essential not only for the initial resuscitation but also for subsequent rehabilitation. On assessment %TBSA is calculated to single digit percentages for fluid calculations, yet estimation of weight may be wildly inaccurate, leading to under or over resuscitation. Furthermore regular weights are necessary to assess a patients nutritional and physiotherapy needs, and thus conforms as a key performance indicator for hospitals in the Burns Network.

Methodology

We reviewed all burns admissions at Queen Elizabeth Hospital, a regional Burns unit, in a 1 month period to determine the percentage of patients weighed on admission and frequency of subsequent measurements. In cases where the weight was estimated, the accuracy was compared to the patients true weight, with the theoretical change in Parklands Calculation where applied.

Results

26 admissions were found in the trial period with 5 being discounted due to chronic nature of burns. Of these, 12 patients were not weighed on initial assessment versus 9 patients who were weighed. In patients who were not weighed, the estimated weight varied from being incorrect by 3% to 18%. For inpatients, the frequency with which patients were weighed varied between once per week up to six times per week

Conclusions

Estimating body weight is difficult in emergency burns presentations, yet receives the same weighting as %TBSA for fluid resuscitation. Providing clinicians visual education on the range body habitus, BMI and weights is key in improving burns resuscitation and rehabilitation. It is imperative that an accurate weight of burns patients is measured as soon as possible and continuously monitored throughout their stay, rather than relying on inaccurate estimations that do not represent the true clinical picture.

Unlocking the Power of Light: A Historical Overview of Lasers in Medicine

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Introduction

The advent of laser technology promised revolutionary changes in the fields of physics, computing and technology, and proof of this can be seen all around us. In medicine we utilise it for scar management, LASIK, and even limited surgical uses. Whilst in popular culture the laser is seen as a powerful beam with great destructive potential, it is important for clinicians to understand the principles behind laser light, and appreciate the process by which it was discovered.

Methodology

A comprehensive literature search was performed on the following topics: the evolution of light theory, history of quantum mechanics, theory of stimulated emission, development of laser technology and the history of laser in medicine.

Results

In this presentation we review the history of light, starting from the classical world and continuing through the likes of Hooke, Newton and Faraday. We look at the advent of quantum theory, working up to the three key pillars of atomic structure, blackbody radiation and the wave-particle duality, before reaching Einstein's seminal paper on stimulated emission. Following this our work follows the race to build the first laser light, and the rapid revolutions that occurred after, before looking at the application of laser light to the medical field and the innovations in chromophore targeting, selective photothermolysis and fractional therapy.

Conclusion

Through this poster we can begin to learn about the efforts required to create the laser light, and how it has impacted and changed the medical field.

The 2022 Energy Crisis: How cost of living has affected incidence of hot water bottle and heater related burns.

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Introduction

Burns sustained from patients using adjunct heaters for self warmth are a common presentation, including burst hot water bottles, contact burns from radiators, or fires caused by improper heater use. With the rise in energy prices due to various global factors, confounded by rising inflation and worsening economic circumstances, there has been an increasing reliance on hot water bottles and other cheap adjuncts to meet heating needs, and concomitant increase in related burns injuries

Methodology

We reviewed our IBID database for all burns patients seen or admitted in 2022 from September to December with injuries related to hot water bottles, radiators or heaters, and compared this against similar data in 2021. We reviewed %TBSA, depth of burn and need for surgery, as well as the temperature on day of injury and average fuel costs for gas and electricity.

Results

From preliminary 2022 data, our Burns Centre saw 101 patients from September to November. 13 patients (12.9%) received burns from hot water bottles (6) and heaters (7). In comparison 209 patients injured themselves in the same period in 2021, with 15 patients (7%) included for the same burns mechanisms.

The average %TBSA for the 2022 cohort was 2.72%, compared to 1.93% in 2021, and 10 patients required admission for an average of 8.9 days, whilst in 2021 only 6 patients were admitted for an average of 9.3 days.

The average temperatures for September to December are comparable (11.9C), as are average minimum temperatures for each month. Average annual gas bill spending for a 3 bedroom house increased significantly from £564 to £1343.

Conclusion

From our data we saw an increase in presentation from adjunct heater use. This may be correlated with the increase in heating bills seen this year

A retrospective case series on laser treatment of burns scars using the POSAS system- are we seeing improvements?

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Introduction

Problematic scarring is a frequent late complication of burn injury, with patients finding scars to be restrictive, itchy, painful, and cosmetically unappealing. There have been many approaches taken to ameliorate the negative effects of burn scars including revision surgery, pressure garments, mechanical massage, and silicone therapy. Various modalities of Laser therapy have also been described in the management of problematic burns scars.

To attempt to assess the effectiveness of this treatment, our unit has used the Patient Observer Scar Assessment Scale or POSAS for grading burns scars, with a previous paper published by Woods et al noting improvements in scar erythema and dyschromia in patients treated between 2013 and 2017.

Aim

In this follow up study, we aim to review POSAS scores in patient treated with Laser therapy for Burns scars after 2017 to assess if there are consistent improvements associated with laser treatment.

Methods

Patients with problematic burns scars were reviewed by a Burns Surgeon in clinic and if felt appropriate referred for Laser therapy. A POSAS score was completed for patients on the initiation of laser treatment, and patients received a minimum of one treatment with Pulse Dyed or Q Switch laser. On completion of treatment, a POSAS score was completed again for each patient. To extract cases for review, the laser procedure room logbook was reviewed and patients histories and POSAS scores were reviewed.

Results/Discussion

We identified 6 patients completing laser therapy from 2017 onward. Number of treatments ranged from 1-5. Mean pre therapy POSAS was 66.5 (median 67 range 38-93), with all patients except one rating their scar pre procedure as 10 (worst imaginable) for colour on the POSAS score. Post procedure the average POSAS score was 44 (median 40.5 range 22-70), with all but one patient noting improvement in the colour of their scar with the Observer score for vascularity improving in all patients. We did note however that all patients reported the irregularity of their scar as the same or significantly worse, and one patient reporting increased pain and itchiness of their scar.

While our results are generally encouraging that laser treatment has improved patient perception of our scars, we did note a high attrition rate to follow up in our study, with many patients failing to attend their final appointment to complete a final POSAS score. Nonetheless, it is clear that for certain well selected patients, laser treatment can be an extremely useful adjunct in treating the sequelae of burns, and one that remains in frequent use in our Burns unit.

Non-excisional debridement under general anaesthetic; an effective approach to management of paediatric scald injuries

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¹Department of Plastic Surgery CHI Crumlin, ²Trinity College, ³RCSI

Introduction

Scalds are the most frequent cause of burn injury in children, with approximately 250-300 cases presenting to the Irish national paediatric burns centre annually. Initial management can be challenging due to the pain and distress of cleaning and dressing burn wounds in children. To offset this, we have adopted an approach of early non-excisional debridement and dressing under general anaesthetic (GA).

Purpose

To review short-term outcomes of paediatric scald injuries managed by non-excisional debridement under GA.

Methods

Since 2018, all paediatric patients with scald burns over 4% total body surface area (TBSA) or involving sensitive areas have been managed as follows: admission to burns ward and non-excisional debridement (deroofing of blisters and cleaning with chlorhexidine soap) under GA within 24 hours of injury; wound swabs, clinical photography and confirmation of TBSA with Lund & Browder chart; Aquacel Ag (Convatec, UK) dressing. Patients are discharged home if well or remain as inpatients until the first dressing change at day 5-7 post injury. If Aquacel Ag remains adherent, this is left in situ for up to 21 days. At this point, if there remains unhealed burn patients are reviewed by a consultant and are admitted for debridement and grafting if deemed appropriate. The electronic theatre management system was interrogated to identify cases from 1st of August 2021 and 31st July 2022. Paper charts were reviewed to assess adherence to the protocol and short-term outcomes including requirement for skin grafting and time to re-epithelialisation.

Results/Discussion

Local experience with this protocol has been satisfactory, with nursing and surgical staff reporting that initial treatment is more consistent, less stressful for patients and parents and leads to decreased frequency of dressing changes. From August 2021 to August 2022, 32 cases were managed according to the described protocol. Of these 9/32 (28%) were fully healed at day 21, 9/32 (28%) ultimately required debridement and grafting, and the remaining 14/32 (44%) had minimal remaining areas of unhealed burn at day 21 and were managed conservatively (time to complete re-epithelialisation ranging from 23-56 days). Kimble et al. reported that non-excisional debridement under general Anaesthesia (GA) can decrease time to re-epithelialisation and our results are similar to those described [1]. Future work will examine long term outcomes including scarring, as well as patient/parent- reported outcomes.

Percutaneous collagen induction therapy as an adjunct to scar management in burns patients - a case report and review of the literature.

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Introduction

Percutaneous collagen induction therapy (micro needling) is a minimally invasive treatment whereby small gauge needles are used to create fine puncture wounds in the epidermis and papillary dermis. This technique is used to stimulate growth factor and collagen production with improvements in skin texture and laxity being observed by study participants as well as a significant increase of collagen being demonstrated upon histological analysis.

Micro needling is a useful adjunct in the treatment of burns patients, particularly given that patients experience minimal discomfort and a short down time following the procedure. This treatment can be performed on an outpatient basis which may be appealing given the current healthcare climate and waiting lists for scar revision.

Purpose of the study

We summarise current evidence regarding the efficacy of micro needling. We demonstrate our experience of the benefits of micro needling through a clinical case report.

Methods

A search of available literature was completed using Ovid, Cinahl, Proquest and PubMed. Search terms used were “percutaneous collagen induction” OR “micro needling” AND “scars” AND “burn”. A total of 204 publications were identified and 317 reviews from the Cochrane library. Animal studies and combination treatments were excluded. Title and abstract were used to screen available literature.

We report the case of a thirteen-year-old female who sustained an 8% TBSA flame burn to her head, neck and shoulders in 2018. This patient underwent excision and split thickness skin grafting in the acute period. Subsequently, Y-V plasty were performed for bilateral neck contractures in 2019. Eight weeks following this, this patient began a course of five micro needling sessions. Subjective and objective assessments in the form of medical photographs, Vancouver Scar Scale (VSS) and Patient Observer Scar Scale (POSAS) were performed during this period.

Results / Discussion

A total of 8 studies were included in the literature review. Several studies demonstrated statistical improvements in VSS and POSAS following micro needling. Histological analysis of punch biopsies demonstrated increased collagen and elastin as well as increased thickness of the stratum spinosum at 6- and 12-months following treatment. Assessment utilising light spectrometry showed erythema reduction in one patient cohort. Improvements in VSS were seen in patients at a range of 1 year to 33 years post burn, suggesting that this can be a useful adjunct even in later stages of scar management.

Serial medical photographs demonstrate considerable improvements in scar texture and pigmentation in the patient described in our case report. Over a period of 24 months following commencement of micro needling we found an improvement across three VSS indicators (pliability, vascularity and pigmentation), with a 38% improvement in overall score.

The results above demonstrate that micro needling is a useful adjunct in the management of post burn scarring, with evidence to show scar improvements on a micro and macroscopic level. Micro needling can be facilitated on an outpatient basis with minimal downtime. This is beneficial for the patient and micro needling may prove a useful addition in scar management given the present waiting lists for scar revision.

It's more than just a fun holiday - The effects that attending a burns camp has on children, their families and staff involved. (Care)

Roberts W¹

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Aim

This poster presentation will describe the experiences of children and staff who attended their first National Burn Camp, how the experiences have affected everyone involved.

Introduction

Birmingham Children's Hospital following information gained from BBA and SIG group a small number of staff decided it would be a good idea to offer this opportunity to our patients.

The poster highlights how the MDT worked together to access a National Burns Camp. Some of the obstacles were not only organisational, but also the human emotional barriers for the children, their families and staff. We look at the outcomes that the Camp had for not only the children but also the wider family unit.

Method

The Burns centre at Birmingham Children's Hospital was passionate about giving our families the chance to access one of these National Camps. Our first step was to organise a small local outdoor activity day for six children and reflect on this.

We then took a small group of children to a National Burns Jamboree. The children who attended were those of families who had attended a conference a few years ago.

Results

The information collected from these events was obtained via observation by staff in attendance. Feedback was sought (written and verbal) from the children who took part and the parents, about how attending these experiences has affected them/their child.

Behaviours observed -

Children were able to develop relationships with others that were supportive and built on common ground, since this Camp the children have now developed and maintained relationships with each other and other children from other burn camp groups.

It was also observed that while the parents were waiting with their child they would start to talk together, this in turn enabled them to develop supportive relationships.

Following a staff debrief after camp, it was agreed that the positive outcomes were massive and improved their relationship with us as health care professionals as well.

Discussion

We had opted to capture information through observations of our children and their interaction with others at the camp, it was felt that this approach allowed the children to initiate contact with others naturally.

Conclusion

Events that are based outside of the hospital setting will not only provide a chance for the children to have fun and to push themselves physically, but also help protect their emotional self through the creation of relationships with children who are going through a similar journey to themselves.

This is more difficult in the hospital setting as this could involve a lot of emotional trauma for the child and their families. This hinders the chance to make connections with others as the child may feel vulnerable due to their feelings of being in hospital.

Using text reminders to encourage the use of prophylactic analgesia for new patients in the adult outpatient setting

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Introduction;

Pain control in burns is complex. Many studies have linked poor pain control to poor wound healing, fear and anxiety, increased pain perception and loss of faith in the burns team.

As set out by the Standards of Burns Care, analgesia should be timely and effective. The time constraints in the outpatient setting limit what we can give and how timely analgesia can be. There is no current standardised way to encourage prophylactic analgesia in our unit for those coming in for a new outpatient dressing appointment.

Purpose of the study;

Increase the amount of people who take prophylactic analgesia before their first appointment.

Decrease pain scores for during the dressing procedure.

Methods;

Use ISLA care to text patients the morning of their appointment, with a reminder to take simple analgesia 30 minutes before their appointment time.

ISLA is a software already used in the clinic, therefore training costs are minimal. It also upholds principles of information governance.

We measure if new patients have taken analgesia before their appointment, and their pain rating on a basic verbal numeric rating scale. We hope to increase the number of people who have taken prophylactic analgesia and reduce pain scores on average. These outcome measures are already ingrained into the forms we complete on the patients' electronic patient record (Cerner).

A secondary outcome measure is how many no shows for new appointments there are- this is also documented on Cerner.

Audit frameworks were taken from the Healthcare Quality Improvement Partnership, audit time-frames being 2 weeks pre intervention and 2 weeks peri/post intervention. Using the six-stage framework set out by NHS institute for innovation and improvement; stakeholders have been identified, change models utilized and includes the involvement of the MDT at every stage.

Results;

The number of new patients seen in a two-week period is a maximum of 80. Therefore, 80 control pre-intervention sets of data will be compared to 80 post-intervention sets of data. Through this, discussion will be based around successes and limitations of this intervention and implications of applying this intervention to ward based outpatients and paediatric outpatients.

Special thanks to

ISLA care

Module leads of the Advanced Burns Care Course at the University of East Anglia who have evaluated and marked this intervention for change as part of the course

Central venous catheter related bloodstream infections in adult inpatients in a tertiary burns intensive care unit

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¹St Andrew's

Introduction:

Injury from a burn facilitates bacteraemia in patients secondary to the breakdown of the protective skin barrier allowing for the entry and colonisation of bacteria, immunosuppression, prolonged hospitalisation, as well as the use of invasive devices including Central Venous Catheters (CVCs). In patients with burns, positive bloodstream infections are assumed to be related to CVCs and are termed catheter line associated blood stream infections (CLASBIs). Over the years, literature has wavered on whether routine line replacement could reduce the incidence of CLASBI. However, there are no formal guidelines on the need for routine CVC changes in adult patients in a burns intensive care unit.

Purpose of the Study:

This study focuses on establishing the incidence of CLASBIs in adult inpatients with burns and the relationship between the duration of CVCs and positive microbiology.

Methods:

We conducted a retrospective review of all adult patients admitted to the Burn's Intensive Care Unit (BICU) at a Tertiary Burns Centre from January 1st, 2019, until December 31st 2021 for over five days. Consecutive data was collected on the location of CVCs, their duration, and any concurrent positive blood cultures. Approval was sought from our local audit committee prior to commencing notes review. We recorded whether CVCs were inserted locally or at referring hospitals. Information on age, total burn surface area, burn injury and duration of stay were also collected. Information on burns demographics and microbiology sourced from electronic trust databases.

Results:

There was a total of 75 patients with an average age of 51 (range 22-86). 49 (65%) patients were male. Average length of stay was 38 days (5-242), and average total burn surface area was 37% (2.5-90). 26 patients (35%) had their initial lines inserted at referring hospitals. 50 burns were flame, 2 were flash, 2 were scald, 2 were chemical and 2 were electrical, 1 was contact and 14 were other.

There were 383 CVC events. 303 central lines and 80 vascular catheters were introduced, 48% (186) by femoral, 43% (164) internal jugular and 9% (33) by subclavian approach. The average CVC duration was 7 days (0-18) days.

45% of patients (34/75) developed CLASBI and 13% of patients (10/75) had multiple positive cultures. There was a total of 50 positive bloodstream infections, a 13% (50/383) positive rate. Gram negative rods were involved in 27 infections. However, common organisms included *Pseudomonas* (14 cases) and *Staphylococcus* species (23 cases).

Infection associated lines were in for an average of 9 days with an average of 7 days before CLASBI. Out of the positive bloodstream infections 54% (27/50) were related to femoral, 44% (22/50) to internal jugular and 2% (1/50) to subclavian lines.

Conclusion:

These findings support evidence that the “at risk period” is 6-11 days post CVC insertion. Though routinely changing lines may increase the complications that follow a line change, there needs to be high index of suspicion for a central line infection in any patient admitted to BICU who becomes unwell during this period and a line change may be warranted.

A quantitative analysis of surgical fluid infiltration in the non-resuscitation Paediatric burn harvest and grafting.

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Introduction: Our Centre is a tertiary burn referral centre and admits approximately 60 children per annum with small non-resuscitation burns for excision and grafting surgery which involves subcutaneous fluid infiltration. Currently, there are no guidelines to predict safe volumes of Infiltration fluid, nor a tool to record the volumes used. This Study examines the total fluid volumes given to a paediatric burn surgical cohort.

Methods: Data were collected over a three-month period in 2022. Data collected included age, weight, location of burn, total body surface area (TBSA) burnt, volumes of IV fluids given, volume of Infiltration fluid given during surgery, mechanism of burn and post-operative complications. During the evening ward-round (typically two to seven hours post procedure), complications of over-hydration were sought which included electrolyte disturbances, excessive urine output, cardiorespiratory signs of hypervolaemia, and non-surgical site peripheral oedema.

Results: Data were collected on a convenient sample of 16 patients (circa 80% of possible cases). Data collection was limited by logistic variables related to the study time period, but were nevertheless considered representative of surgical staff and our patient population. The ages ranged from 1 to 12 years, with a mean (SD) of 5(4.8) years. Body weight ranged from 9kg to 58kg. The TBSA burnt ranged from 1% to 14% with a median (IQR) of 3% (1.5% to 8%), with at least 12 patients having scald injuries. Infiltration fluid volume was median (IQR) of 375ml (205 to 500ml), resulting in a mean of 23ml/kg body weight. IV fluid infused was median 240ml. The total fluid (sum of IV plus Infiltration fluid) (per kg BW) ranged from 15 to 70 ml/kg BW. The total fluid per kg body weight per percent burn (ml/kg/%burn) ranged from 1.2 to 33 ml/kg/%burn, with a mean (SD) of 13(9) ml/kg/%burn. No obvious post operative complications were recorded.

Discussion: The Infiltration fluid volume is additive with the IV fluid volume and so the total intra-operative fluid burden might be excessive, specifically when contrasted with the 10ml/kg bolus advised within the Advanced Paediatric Life Support guidelines. Nevertheless, there were no apparent post-operative complications observed. Children with small burns are usually not sick and, have the 'physiological reserve' to tolerate large fluid boluses. Capillary leak occurs in major burns (>30% TBSA) and can occur in sepsis (a common complication of Burns) which combined with the fluid volumes given can lead to tissue oedema, a recognised cause of organ dysfunction.

Conclusion: These findings may suggest that as total fluid volumes given are well in excess of current total fluid volume guidelines for maintenance and resuscitation that these guidelines may have scope for revision. A preoperative protocol for discerning intravenous maintenance plus surgical site Infiltration fluid requirements as a fraction of agreed targeted total daily fluid provision is needed to minimise unintended consequences of unchecked fluid administration.

Northeast of Scotland Sealed Silver dressing practice in Paediatric burn injured patients

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Introduction

Infection and sepsis are the leading cause of death in burns injuries, preventing infection is of utmost importance. Burn injuries can be managed with a combination of dressings, prophylactic antibiotics and reconstruction when required; these are resource heavy in both time and staffing. Non-surgical debridement followed by dressing changes are important for continuous monitoring and cleaning of burn wounds, however frequent dressings changes in the awake child can lead to long-lasting mental health effects such as post-traumatic stress disorder. Liberal use of antibiotics has led to the increased resistance and the emergence of superbugs hence are becoming more difficult to treat. We have assessed our practice in the use of sealed silver dressings in paediatric patients at the Royal Aberdeen Children's Hospital over a 3-year period.

Purpose of the study

The purpose of our study is to review practice in our hospital using this technique and to assess its outcomes, focusing in particular on infection rates, both local and systemic.

Methods

This was a retrospective review utilising information held on the electronic patient record. Data is also routinely collected for input into the Care of Burns in Scotland (CoBiS) clinically managed network database. Data was collected for all patients referred to our Paediatric Plastic surgery department with burn injuries between November 2019 and December 2022. The review was registered with the NHS Grampian Quality Improvement Hub.

Results / Discussion

Our clinical audit focused on all burn patients referred to and managed by the Plastic Surgery team at the Royal Aberdeen Children's Hospital between November of 2019 and December 2022. Sealed silver dressings were first introduced to our unit at the end of 2019; we have since treated 362 burns patients, 186 of which were treated with the ActicoatTM protocol. All other patients suffered burns in anatomical locations not suitable for this dressing or suffered less severe injuries requiring only simple dressings. Application of our silver dressing occurs in theatre under general anaesthetic and lasts for 7 days before requiring a change; patients return to theatre every 7 days if further debridement or ActicoatTM dressings are anticipated. Prophylactic antibiotics are not routinely prescribed. This reduces PTSD, pain, number of dressing changes, overall burden to the service and most importantly burden to the patient. Furthermore, with patient education, these patients can usually be managed as outpatients with planned day-case unit admissions, this reduces duration of inpatient stay. Of our 186 patients; 7 required antibiotic courses, 3 were prescribed prophylactically, 2 were started due to pyrexia of unknown origin and 2 for Toxic Shock Syndrome (TSS). It is important to emphasize patients that developed TSS had delayed presentations and were not managed as per our usual local protocol requiring debridement and ActicoatTM dressings in theatre within 48 hours of presentation. All other patients recovered with no episodes of local or systemic infection.

Conclusions

We concluded that our protocol achieves low rates of infection without routine use of prophylactic antibiotics and minimizes burden on the service.

A review of the clinical effectiveness of using a dynamic prototype axillar support to maintain good positioning of the upper limb after burn injury, the overall effect this has on shoulder range of motion, the impacts it has on the need for scar release surgery.

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Shoulder contractures represent the largest absolute ROM losses compared to any other joint in severely injured adult burns patients. There is also a high incidence of these patients needing scar releases when contracture is not prevented. As physiotherapists treating burns survivors it is our aim to prevent scar contracture and maintain functional ROM, therefore reducing disability and the need for release surgery. Many Burn centres/trusts currently use pillows and occasionally Bedford slings to aid positioning. The problems we have found with this, especially with patients on ICU, is during positional changes, staff change overs or due to lack of space the preferred position of the axillar/upper limb to aid contracture prevention is not always maintained.

Working with our physics and clinical engineering department we have come up with a dynamic prototype that attaches to hospital beds to aid in the positioning of the affected upper limb/chest region aimed at patients with moderate / severe injuries at higher risk of developing scar contractures without this intervention.

Our goal is to see if an attachment to the bed specifically designed to aid upper limb positioning will aid in more consistent upper limb positioning and therefore improve the outcomes of our upper limb/chest burns in terms of range of motion and reduce the need for scar release surgery.

We are currently in the process of reviewing this prototype through a single person case study to review its effectiveness within practice.

The main outcome measure we are using is shoulder range of movement, measured with the use of a goniometer, however we are also looking at ease of use, compliance and cost effectiveness.

Enzymatic debridement of deep facial burns with Nexobrid™: the Queen Victoria Hospital experience

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Introduction

Deep facial burns present unique challenges due to the risk of scarring and contracture which can negatively impact patients' cosmesis and function. Enzymatic debridement of burns with bromelain-based agents, such as Nexobrid™, may improve scarring through maximal preservation of viable tissue. However, Nexobrid™ use in facial burns is poorly described in the literature.

Methods

We conducted a single-centre case series, retrospectively reviewing all patients treated with Nexobrid™ for deep facial burns between January 2016 and July 2022.

Results

We identified five female patients aged 27-69 with 1-6% deep burns of different aetiologies (flame, contact and flash flame). All patients received Nexobrid™ within 72 hours of injury and underwent allograft application the following day. Length of hospital stay ranged from 3 to 10 days (mean 4.6). Four out of five patients underwent delayed autograft at 15 to 29 days (mean 25) and time to complete healing varied from 24 to 93 days (mean 52). Patients displayed good aesthetic and functional outcomes at follow-up ranging from 3 - 36 months.

Conclusions

From our experience at Queen Victoria Hospital, we observed good aesthetic and functional outcomes using Nexobrid™ in deep facial burns. The process is safe and effective and we hope that our contribution will encourage further research and practice in this field.

Pavement burns in the United Kingdom – an emerging but preventable phenomenon

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Introduction

Pavement burns are an established risk of skin contact with asphalt in high temperature climates. Pavement surfaces are often hotter than ambient air temperatures due to direct sunlight/radiant heat absorption. Surfaces such as asphalt/concrete can become hot enough to cause burns when air temperatures exceed 35°C. Historically, such extremes have rarely been recorded in the United Kingdom (UK) and the incidence of pavement burns has remained confined to locations experiencing high temperatures and dry climate zones. However, with rises in both global and seasonal peak temperatures, UK summer climate conditions are reaching the extremes required to cause pavement burns.

Purpose

Increase awareness of the emerging risk of pavement burns in the UK and facilitate discussion of future planning/preventative measures.

Methods

Retrospective review of admissions to a tertiary burn centre identified two cases that presented with pavement burns sustained on the hottest recorded UK calendar day.

Discussion

We report two cases of pavement burns in the UK, that occurred on 19/07/2022. The first case was a 66-year-old male found unresponsive during a car journey and placed in the recovery position for fifteen minutes on asphalt whilst awaiting the emergency services. He sustained partial thickness burns to the both upper limbs, right buttock, right lower leg (full-thickness 1%) and right flank (deep dermal 1%). The second case was a 58-year-old female who sustained 2% TBSA partial thickness pavement burns to her bilateral forearms/hands and left knee after collapsing with heat stroke. The estimated contact length was 45 minutes. Both were initially managed conservatively until medically fit for excision and grafting.

On 19/07/22, the maximum air temperature exceeded 40°C in multiple UK locations, a temperature capable of causing unshaded asphalt to reach 68.5°C. This is hot enough to cause pavement burns in under three seconds. Recent United Nations Intergovernmental Panel on Climate Change projections estimate that UK temperatures could rise by up to 6.8°C within the next sixty years. The incidence of pavement burns in the UK – where the predominant material is asphalt – will therefore likely increase. Furthermore, when compared to similar TBSA scalds/flame burns, pavement burns are reported to require greater length of hospital stay, greater need for surgery, and greater cost per unit surface area burned. Currently, UK National Burn Injury Database coding does not distinguish contact burns caused by pavement/asphalt, not allowing pavement burn incidence to be identified. Addressing this would provide more accurate incidence data, help predict seasonal variation, allow burns centres to be better prepared, and help target public health intervention; for example, education on avoiding pavement-skin contact, wearing appropriate footwear, and not placing patients on asphalt during first aid.

Conclusion

Pavement burns represent an emerging mechanism of injury to UK burn centres. We believe the two cases described here may be the first reported UK incidents and that there is scope for increased future incidence of such injuries. With current climate trends, UK-based burns multidisciplinary teams should be prepared to manage such patients and use seasonal variation to assist in planning and preventative measures.

The Human Cost of Rising Energy Prices - Experience from a Major Burns Unit in the South West of England.

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Background

With the current increase in energy prices across the UK, people are utilising supplementary heating and lighting measures in an attempt to reduce their energy bills. Such methods include the use of hot water bottles and candles. We postulate that the increased use of such alternatives could result in an increase in the presentation of burns at our unit.

Methods

This was a retrospective, single-center, cross-sectional study. Attendances that were a direct result of thermal burns related to the use of hot water bottles or candles were analysed for the periods of October to August 2019 - 2020 and October to August 2021 - 2022. Weather data for the region was also collected to control for environmental differences. The primary outcome was the total number of burns resulting from each modality for each period.

Results

A total of 45 attendances were recorded for October to August 2019 - 2020 and 63 for October to August 2021 - 2022. Hot water bottles accounted for 39 attendances during the 19-20 period, and 47 in the 21-22 period, an increase of 20.1%. Candles accounted for 6 attendees during the 19-20 period and 16 in the 21-22 period, an increase of 166.7%. The mean temperature was 10.21 and 10.71 degrees Celsius during the 19-20 and 21-22 periods respectively.

Discussion

Our findings indicated an overall increase in attendance related directly to the use of supplementary heating and lighting methods of 40% during the 21-22 period compared to the 19-20 period. This could be explained by the increase in energy prices, causing people to turn to alternative sources of heating and lighting. Environmental factors do not seem to have contributed to this increase.

Conclusion

There has been an increase in attendance resulting directly from burns sustained by the use of supplementary heating and lighting measures since the increase in energy prices. We postulate that given the forecast for a further increase in cost over the coming months that there will continue to be a corresponding increase in attendance.

Improving transparent face mask provision by sharing of knowledge and collaborative working between burns therapy services.

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¹St Andrews

Introduction:

Burn injuries to the face can lead to not only functional concerns but issues with confidence and self-esteem this can have a big impact on someone's psychological well-being and integration into society.

Pressure therapy is used to improve scarring; the use of standard material garments are unable to contour to facial features effectively. The use of transparent face mask are more effective but come with a higher cost and are not available at all services.

Patients who required face mask fabrication would previously have to travel as this was only provided at limited burns services. This could mean a delay treatment; patients travelling long distances, increased travel cost to the patient and some patients were unable to access these services, leading to potential poorer scarring outcomes.

Purpose:

To increase knowledge and skills in face mask fabrication for burns therapists and to improve accessibility and patient experience for those requiring facial masks through collaborative working.

Methods:

Facemask fabrication is a highly skilled process that requires specialist equipment and is not offered at every burn service. This would mean patients travelling long distances to other centres and often involve high travel costs. This sometimes means that the patients were unable to engage in services, leading to poor patient experience and potentially poorer scarring outcomes.

This issue was raised within the burns network; we agreed to share the specialist skills needed for fabrication. We could share the use of expensive equipment so multiple units did not have to pay out for duplicate equipment. So we could improve the accessibility for patients requiring transparent masks quickly and effectively.

We organised teaching sessions where we learnt the steps of face mask provision. We learnt how to prepare and take an impression with alginate of the patients face, remove this and make a plaster mould of the face. We also organised the logistics of sending the mould's back to the burns service so they could use their oven to make the masks and the use of the silicone-lined splint material. We were then taught how to fit and alter the face masks to increase pressure to scars as needed.

The first fabrication was completed with support and guidance from the teaching burns service. After this the following face masks have been done independently by us with support if needed.

Discussion:

We have successfully completed three face masks since the collaboration. We are now able to independently assess for the need for a face mask, take an impression of the face and make a plaster mould. This is sent off and the mask is made and sent back to us. We are then able to independently fit the mask and make any alterations.

Conclusion:

This collaboration project shows how the use of the burns network can positively affect patients care. It highlights the importance of the burns network in sharing knowledge, skills and resources. We hope to continue with this shared working and would be happy to assist with further sharing to other burns services.

Nurses deployed for major incident relief: White Island volcanic eruption, New Zealand.

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Introduction:

On 9th December 2019 a volcanic eruption on Whakaari/ White Island in New Zealand (NZ) killing 22 people and severely injured 25 more. Patients were admitted to regional Burns Units at Waikato, Christchurch and Hutt Valley and those with the most extensive burns were admitted to the National Burns Centre (NBC) at Middlemore Hospital in Auckland.

On 22nd January 2020, the NZ Government made a formal request to the UK government for mutual aid in relation to the on-going care needs of these patients.

Four experienced UK Burn Nurses travelled to NZ to work in the National Burns Centre in Auckland.

Principally buddying up with the NZ Nurses to assist with dressing changes, expected to work under the direction of the nurse in charge and be sensitive to the situation and provide support to local burns team members who have been working under enormous pressure for many weeks.

Objectives:

A reflection on a month spent in National Burns Centre (NBC), Middlemore Hospital, Auckland.

Methods:

The four of us work in four different Burns Centres across the UK (Royal Victoria Infirmary, Newcastle, St Andrew's Hospital Broomfield, Chelsea and Westminster Hospital and Queen Victoria Hospital). Having never met before greeting each other in the airport, we had to quickly bond together and present ourselves as "Team UK". The next challenge was to slip seamlessly into the National Burns Centre team.

Results:

We assisted in many dressing change procedures under sedation and re padding throughout the shifts. This took the strain of large, labour intensive, stressful dressings off the NBC team, allowing the regular staff to concentrate on general nursing care, reliving some of their time and personal pressures.

Staff were very appreciative of our help and specialist skills.

Discussion:

Reflecting on the staffing pressures it left on our home units.

There were many differences and similarities between the UK and New Zealand units but also between our individual units. This created many discussion points amongst ourselves and the NBC nurses.

Challenges:

- ☐ Working within local protocols and policies.
- ☐ Adapting to local dressing procedures.
- ☐ Working within an unfamiliar Multi-disciplinary team.
- ☐ Fitting into an already well-established team.
- ☐ Stepping into the aftermath of a Nations trauma.
- ☐ Trying to be help not hindrance in an exhausted team.
- ☐ Quickly learn to adapt to manage the patients and their families anxieties and fears as the trauma of the event was still very present in their minds.

Conclusion:

- Insight gained into the logistics of getting the team to New Zealand and enabling them to leave their own Burns Units will benefit the formation and development of Burns Initial Response Teams (BIRT) in the UK.

- Knowing when we are needed. At what stage are nurses required to assist in wound management: at the first few weeks or the months afterwards?

Nurse led Enzymatic debridement (Nexobrid) within the Burns Ward setting.

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Introduction: Since the introduction of enzymatic debridement (Nexobrid), it has always been a Nurse led treatment applied within the Burns Ward setting at the Queen Victoria Hospital Burns Unit.

Objective: A general reflection of the origins of Nexobrid being Nurse led. Establishing Nurses competency in the application of Nexobrid and evaluate its benefits within the Ward setting in comparison to Theatre or ITU setting.

Methods:

- how it first started and when
- why it was decided to be nurse led
- why it was ward based not theatre or ccu
- general evolution in training (was it always RN's train each other)
- Creation of competency – standardisation
- Creation of protocol booklet – standardisation
- Creation of training videos and pocket guide booklets
- Support from Mediowound – in house training and Germany
- Pain management – close working relationship with pain team, anaesthetists and psychological therapists. Use of blocks, spinals and light sedation, in combination with non-pharmacological techniques such as Virtual Reality Headset, mood lighting, music and breathing exercises.
- Discover how other Burns units in the country to see how, who and where they apply nexobrid.

Results:

- Patients did not undergo unnecessary general anaesthesia.
- Patients able to go home the same day depending on TBSA%, pain management and clinical assessment.
- Reduced anxiety for patients, as the anticipation of going to Theatre is eliminated therefore is a more positive patient experience.
- Empowering Nurses, upskilling, increased their autonomy.
- Saves valuable Theatre time – could estimate hours saved
- Cost effective, as Theatre space, specialist equipment and team are not being unnecessarily utilised.
- “Think Nexobrid!” prompt added to referral forms.
- Number of patients that have had NexoBrid.
- Number of patients requiring skin grafting – pre and post Nexobrid at QVH.
- Nurses being advocates for patients – speaking up if we do not think it an appropriate procedure for the patient.
- Discussion of how standardisation of the process has helped with documentation and training.

Conclusions: Training for the application of Nexobrid has evolved over the years. It has become more formalised with incorporating it as a competency within our Nurses Burns Competency booklet and with the introduction of a Nexobrid Protocol. Nexobrid application for our Nursing team has increased their skill set and autonomy, which has also lead to upskilling Nurses in the application of Allograft post Nexobrid in 2018. This has also been added to the Burns Competencies for all our Nursing staff. It has vastly benefited the patients as the enzymatic debridement and Allograft dressing has become one inclusive procedure, allowing

some patients to go home the same day as the treatment. Thereby, resulting in it being time saving and more cost effective. Furthermore, it reduces patients' anxieties and decreases the risk of hospital acquired infections. Ward based procedures such as this lessens patients' exposure to the risks associated with general anaesthesia.

Heparin in the treatment of burns – A systematic review

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Background: Heparin is well-known for its anti-coagulant and anti-inflammatory effects. It has historically been used for the treatment of burns, however, it is not common burns care practice. There is evidence in literature of efficacy towards the treatment of burns.

Purpose: This systematic review aims to assess the evidence towards use of heparin in the treatment of burns.

Methods: An electronic literature search was performed across the following databases for relevant studies: PubMed, EMBASE and the Cochrane Central Register for Controlled Trials (CENTRAL). Included studies were summarised and quality of evidence assessed. Descriptive statistics was utilised to represent the data.

Results: 10 studies met the criteria for inclusion in this systematic review. Mechanism of burn injury, depth and total body surface area varied between studies. Routes of heparin administration included topical, subcutaneous, intravenous and aerosolised. More than 50% of the studies demonstrated a specific benefit in use of heparin with different primary outcomes being measured; pain, hospital stay, wound healing and mortality.

Conclusion: Individual studies demonstrate benefits in heparin use, nevertheless, level of evidence quality inhibits a meta-analysis and safe conclusions. It is in the authors' belief that a well-designed multi-centre trial might be of benefit in assessing the effect of heparin on treatment of burns.

Nitrous oxide frostbite injuries in young adults and children: No laughing matter

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Introduction

Nitrous oxide (N₂O) is a commonly used anaesthetic gas in the medical field but its recreational use has increased especially amongst young adults due to its perception as a harmless drug and ease of access thanks to its common use as a propellant for whipped cream. Airway frostbite injuries secondary to inhaled N₂O have been reported since the late 90's however in recent years reports of frostbite of the thighs due to contact with rapidly cooling N₂O cylinders have been increasing.

Purpose of study

The objective of this review is to explore the trend of N₂O use and resultant frostbite injuries amongst young adults in social media and published literature to better inform future prevention campaigns.

Methods

The study was conducted in two parts: Firstly, a systematic literature search was performed to identify case reports using keywords "nitrous oxide" and "frost bite". The demographics of patients, clinical presentation, treatment and outcomes were collected from these reports. Secondly, trending patterns or interest over time of the search term "Nitrous oxide" and its slang were investigated on common social media platforms including Tik Tok, YouTube and Google.

Results/Discussion

The literature review identified three case series of frostbite injuries to the thigh secondary to N₂O, all published after 2020. Prior to this, only airway frostbite injuries were reported. Search for trending patterns showed that interest in N₂O has increased in recent years with the largest audience (>80%) in the 18-24 years age group. Google trends have also shown spikes in interest over particularly over the summer months. The majority of social media coverage of N₂O relates to the amusing euphoric response of patients after its legal medical use, e.g. in dentistry procedures, however multiple instances of its recreational use have also been found. A few instances of media warning of its dangers have been encountered.

Conclusion

The prevalence of N₂O on traditional and social media remains high, and exploiting these media to educate young adults on the dangers of its use in combination with legislation changes may help reduce incidence of harm.

Medical workforce planning in burn surgery in the UK: Perceptions of barriers to recruitment

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Introduction:

Workforce planning is the balance of skill supply against demand within an organisation or system. For burns, as with any surgical specialty, sustained quality recruitment is essential to ensure the provision of high quality care and production of research for generations to come. At recent meetings the topic of consultant recruitment to the specialty has been debated, in particular, the difficulties that some colleagues perceive to recruiting the next generation of burns surgeons.

Objective:

We aimed to explore the perceptions of current trainees and compare these against those of consultant burn surgeons with regards to a career in the specialty, and to see if there were any obvious differences between these groups. It was hoped that this might help generate greater understanding of any potential barriers to recruitment.

Methods:

In 2022, an anonymous online survey was devised. This was distributed via PLASTA, the BBA and an informal Whats App group to consultant burn surgeons and current trainees. For consultants, questions were intended to explore working variety and frequency, in addition to if they perceive difficulties in recruitment, and if so, what they were. Trainees were asked if they would consider burns as a future career, and if so what proportion of time would they like dedicated to this. Trainees were also asked more about ideal working frequency and feelings towards private practice.

Results:

A total of 37 consultants and 102 trainees responded.

Consultants responded who worked in Centres, Units and facilities. Many had experienced difficulties in recruiting, and this was more marked in Burn Centres. The majority of consultants who responded spent more than 50% of their NHS working time providing burns care.

Nearly 60% of trainees who responded indicated that they would like to consider burns as part of their consultant practice. Diversity of work was a standout theme, with respondents wanting to commit around up to 50% of their time to burns, and ideally pairing this with another allied subspecialty such as hand or lower limb surgery. In addition, trainees felt that a burns career could provide reasonable research opportunities.

On call duties and involvement in private practice were also reported by both groups, as there are perceptions that this can influence career choices.

Conclusion:

The results show a mismatch in perceptions between the two groups. Interesting themes were identified amongst the trainees, in particular, the desire for diversity, and the willingness to work frequently. How the competing challenges of diversity and maintenance of skills can be adequately balanced is for wider discussion.

Is there evidence for the role of Calendula officinalis in wound care as an antimicrobial? A systematic review.

Cattell V¹

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The use of herbal therapeutics is becoming more influential and recognised within orthodox medicinal health care delivery systems. Increasing resistance to antimicrobial therapy has a detrimental impact on patients with wounds as few novel antimicrobial therapies are being developed, increasing the risk of serious morbidity and mortality. This systematic review evaluates the role of Calendula officinalis in wound care as a topical herbal antimicrobial therapeutic. Searches were conducted through EBSCOhost, TRIP, and Cochrane. 13 in vivo and in vitro studies were selected through the inclusion and exclusion criteria and reviewed utilising the ARRIVE and CONSORT guidelines. 2 of the studies could be dismissed due to poor design or reporting. The studies included acute wounds only. Calendula officinalis was identified as a safe topical herbal therapeutic that has a potential role as an antimicrobial topical agent, particularly E.coli and S.aureus infections. Limitations of the studies were discussed, including potential barriers to safe implementation for human use in chronic wounds. Potential bias of the author was included as a potential limitation of the review discussion. There is a further need for global collaboration and research in order to establish Calendula officinalis as a topical antimicrobial product in wound care.

What does Capacity Building in burns in resource poor environments really mean?

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Introduction

Interburns has developed a 'comprehensive integrated approach' to improving burn care in resource poor environments. This involves burn teams self-assessing their services against standards using the participatory delivery assessment tool (DAT) to identify strengths and weaknesses. The subsequent gap analysis informs a targeted quality improvement (QI) plan which can be supported through Interburns' portfolio of educational and on-line resources, community initiatives, research and advocacy. The DAT has been used in 35 services in 12 countries. But what does this mean in practice? This presentation describes the comprehensive integrated approach in action.

Method

In February 2022, Interburns was invited to Bugando Medical Centre in Mwanza, Tanzania in partnership with Weill-Cornell Medicine, USA. Before the visit, the Bugando burn team carried out a DAT. Priority areas for improvement included infection control, staff training, and outreach to other services. Over 5 days, the Interburns faculty, comprising a multidisciplinary team from seven countries, delivered a 1.5 day interactive Essential Burn Care course to 40 participants from across Tanzania and Uganda; a half day train-the-trainers workshop on community burn prevention and first aid; nursing and surgical ward rounds, a surgical case discussion forum and a review of the DAT to formulate a practical QI plan.

Results

Participant's knowledge of key aspects of Essential Burn Care increased on average by 38% measured by pre and post test scores; knowledge around burn wound infection improved by 44%.

Ongoing contacts with the nursing team have resulted in the identification of three QI projects addressing areas highlighted by the DAT. Two nurses from the unit joined as faculty for a 5 day Advanced Burn Care (Nursing) course at Muhimbili Hospital, Dar es Salaam in February 2023, training 35 nurses from across Africa. The course was led by a nurse from a low resource setting (Malawi) who first participated in Essential Burn Care and has gone on to deliver successful QI projects and be a key member of Interburns network.

Discussion/Conclusion

Managing burns in a low resource setting is challenging. Achieving sustainable change involves a comprehensive approach from community level through to hospital provision. Improvement requires dedicated leadership from individuals as part of a team and the know-how to bring about change. The values of encouraging and providing tailored ongoing support for teams cannot be underestimated.

The use of a multimodal approach to a deep facial friction burns in a Fitzpatrick type 4 individual.

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Introduction

Our face is what identifies us and is exposed to the world, as such burn scars to the face cannot be hidden and can play a huge impact on psychological well-being. Depth of burn, type to healing and genetic predisposition all play a role in final scar outcomes. Deep facial burns in higher Fitzpatrick skin types are often associated with poorer scar outcomes. These outcomes can be disfiguring for patients. Given that the teenage years are associated with significant hormonal changes, this is a challenging time emotionally for the individual. A deep facial burn in this time can be particularly challenging for the patient.

Purpose

To present the outcomes of multimodal management of burn wound in higher Fitzpatrick teenage boy.

Methods

A deep facial burn extending to malar fat pad of the right cheek was treated with secondary intention wound healing, facilitated by skin taping.

Once the wounds were healed, a series of triamcinolone injections, scar massage was undertaken.

Fat grafting, nano fat grafting to the scar and a z-plasties were done.

The burns were treated over a period spanning 2 years, using various techniques. A POSA score was performed prior to each treatment intervention and at 6 week and three months after each intervention. A POSA score was also done by the caregiver

Discussion

Deep facial burns pose a challenge to provide a fair aesthetic outcome, delayed wound healing is known to be associated with increased risk of hypertrophic scarring. However, skin grafting of the face is far from ideal, providing a patchwork appearance to the face, colour and texture differences. The options for deep burns are thus few as both choices, graft or healed scar, are very noticeable and ugly.

Conclusion

The POSA scales of the mum and the clinician all showed an improvement after the intervention. The initial patient scores didn't show an improvement. The patient was a known epileptic on changing medication, the burn coupled with the covid pandemic significantly affected mood and outcome. Prior to the last intervention POSA scale showed improvement.

The final results of the treatment are fair and the patient and care giver are satisfied with the eventual outcome.

Patient evaluation of the use of hydrotherapy in healed burn patients in a UK adult burns service.

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Introduction:

Hydrotherapy has been used for many years as a treatment modality by physiotherapists to improve range of movement, muscle strength, balance and exercise tolerance. The literature has also shown it to have psychological benefits such as improved self-esteem and confidence. Hydrotherapy has been offered to healed burn patients within this UK adult burns service since June 2022. Through discussion with the National Burn Therapists' Special Interest Group, it appears that there is only one other service that currently offers hydrotherapy to burn patients in the UK.

Purpose of the study:

This study aimed to evaluate patient satisfaction following hydrotherapy sessions and devise an appropriate tool to gather feedback. The data was then analysed using a thematic analysis approach.

Method:

Once the burn patients had either minimal or no open wounds, patients were screened for suitability of going into the hydrotherapy pool. This included completing a Trust questionnaire used for all hydrotherapy patients in the outpatient setting. These patients were then offered a one hour session of hydrotherapy a week until it was deemed of no further benefit and goals were achieved. This supplemented their land based therapy and occupational therapy.

A questionnaire was devised and consisted of open and closed questions; this included some comments that were rated on a Likert scale. The questions covered a range of subjects including benefits and improvements that could be made to the burns hydrotherapy service. Prior to being given out to the patients, the tool was formatted and submitted through clinical governance within the Hospital Trust. All patients who had accessed the hydrotherapy sessions were provided with the questionnaire and were returned via post or handed in directly. The two auditors collated the results and identified common themes. These themes were then used to further improve the service.

Results/Discussion:

During the time period of data collection, four patients were appropriate for hydrotherapy treatment and participated in weekly sessions. Questionnaire results indicated that all patients found this treatment modality to be of benefit. They documented feeling supported in the pool environment in terms of exposure of scarring and allowing patients to return to swimming and activities of daily living. Patients also reported improvements in range of movement.

Conclusion:

Hydrotherapy has been a beneficial addition to the service due to its physical and psychological benefits post burn injury. Further research should evaluate this through assessing more objective measures and with a larger sample size.