

INTERNATIONAL ABSTRACTS

ALBUMIN ADMINISTRATION FOR FLUID RESUSCITATION IN BURN PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

In this paper, the authors present the results of a systematic review of the literature on albumin administration for fluid resuscitation in burn patients. Their objective was to summarize the effect on mortality of albumin compared to non-albumin solutions during the fluid resuscitation phase of burn-injured patients. Previous reviews have suggested that albumin increases mortality in burn patients. The authors searched MEDLINE, EMBASE and CENTRAL as well as the content of two journals on burn care, *Burns* and *Journal of Burn Care and Research*. Four trials involving 140 patients were included in their meta-analysis. They did not find a significant benefit of albumin solutions as resuscitation fluid on mortality in burn patients (relative risk (RR) 1.6; 95% confidence interval (CI), 0.63–4.08). Total volume of fluid infusion during the phase of resuscitation was lower in patients receiving albumin containing solution -1.00 ml/kg/%TBSA (total body surface area) (95% CI, -1.42 to -0.58). The authors' findings indicate that albumin solutions are not associated with higher mortality in burn patients.

Eljaiek R et al.
Burns, 43(1): 17-24, 2017

THE PSYCHOLOGICAL IMPACT OF FIRST BURN CAMP IN NICARAGUA

Asociacion Pro-Ninos Quemados de Nicaragua (APROQUEN) is a comprehensive burn centre that provides a holistic and integrated approach to treating burns. Recognising the fact that children with burn injuries also need psychological support for their complete well-being and to help them reintegrate back into their environment, APROQUEN developed and implemented the first burn camp in Latin America, 'Confio en Mi' (I trust myself). The camp focused on self-esteem. The program included theory (educational) and practical (applied) components where the campers had the opportunity to examine and discuss self-esteem, depression and anxiety with other campers and staff through classroom-type activities. Participants were children who had survived major burns ($N = 33$; 58% women; ages 12–25; 61% <18) and were shown to have difficulty socializing. Mean TBSA was 20% and mean age at the time of burn injury was 13. Most campers (40%) were enrolled in secondary school, 30% in elementary school, and 21% in college. Standardized measures (CDI-2 Parent Form and Child Form, Rosenberg Scale, APROQUEN Burn Camp Measure Parent and Child Form, Beck Anxiety Inventory and Beck

Depression Inventory) were given to all campers prior to attending camp. The same measures were given 2 weeks after the camp and again 6 months later. The results indicated that Camp 'Confio en Mi' had a significant impact on the campers' level of anxiety, depression and self-esteem.

Tropez-Arceneaux LL et al.
Journal of Burn Care & Research, 38(1): e1-e7, 2017

ASSESSMENT OF BIOLOGICAL RESPONSE OF LYOPHILIZED CADAVERIC SKIN ALLOGRAFT IN POST BURN RAW AREA AND NONHEALING ULCERS

Extensive full-thickness burns and major injuries resulting in extensive damage to the skin make spontaneous regeneration difficult and compromise patient survival. When a donor area is available, autograft is considered to be the best option. However, if the affected region is extensive, donor area may not be enough. Moreover, sometimes the patient's medical condition does not permit immediate grafting with autologous skin. In such conditions, lyophilized skin allograft can be used for temporary coverage of the wounds. In this prospective study carried out in the Plastic Surgery Unit of Netaji Subhash Chandra Bose (NSCB) Medical College in India over a period of 2 years, the authors evaluate biological response of lyophilized cadaveric skin allografting in 100 cases of thermal burn and non-healing ulcers. Nineteen percent of the lyophilized skin grafts were rejected within 3 weeks, 65% within a month, and 16% after two months. Rejection was defined as when the skin graft became hard and started to separate from the wound edges and finally totally detached from the bed. Out of 100 patients, wounds healed completely in 81 patients, while 19 patients required autografting. 26% of the patients showed infection. A histopathological study was done on the 21st postoperative day and all those who survived skin graft showed infiltration of mononuclear cells, fibroblasts, keratinization, uniformly arranged collagen bundles, and angiogenesis at the junction of graft and graft bed. All grafts that were rejected showed acanthosis, spongiosis and degenerative changes in vascular walls. Neovascularization was not observed in these grafts. The authors conclude that lyophilized cadaveric allograft acts as a mechanical and physiological barrier, and the process of lyophilization helps in minimizing the immunoreactivity of the graft, therefore rejection is not rapid. Lyophilized cadaveric allografts can be lifesaving in cases of severe burn.

Agarwal P et al.
Indian Journal of Burns, 24(1): 13-17, 2016

THERMAL INJURY PATTERNS ASSOCIATED WITH ELECTRONIC CIGARETTES

This report describes an emerging problem associated with e-cigarettes, which are rapidly becoming popular as an alternative to traditional cigarette smoking. E-cigarettes are typically lithium-ion battery-operated devices that simulate smoking by heating a nicotine-solution into a vapour that the user inhales. The authors describe their recent experience with thermal injuries associated with e-cigarette use. Over a 2-year period between April 1, 2014 and March 31, 2016, ten patients with burn injuries caused by e-cigarette-related explosions were initially evaluated in the Emergency Department of the San Antonio Military Medical Center, before being admitted to the Burn Center for further management. Seven patients reported injury as the result of the e-cigarette battery self-combusting in their trouser pocket or lap, 1 reported vaporizer explosion, 1 was actively using the e-cigarette when the explosion occurred, and 1 reported ignition of the e-cigarette lighter during a motorcycle crash. The authors conclude that additional work is needed to improve our understanding of the hazards associated with e-cigarette use, and increase awareness among healthcare providers and the general public of potential harms. They recommend development of a standardized incident reporting protocol for injuries associated with e-cigarettes in order to better characterize the problem at hand.

Jiwani AZ et al.
International Journal of Burns & Trauma, 7(1): 1-5, 2017

A PROSPECTIVE STUDY OF TIME TO HEALING AND HYPERTROPHIC SCARRING IN PAEDIATRIC BURNS: EVERY DAY COUNTS

The main aim of this study was to determine whether incidence of hypertrophic scarring varied according to both the time taken for the burn to heal and the skin type of the patient. A secondary aim was to establish the rate of hypertrophic scarring in paediatric patients treated non-operatively at the authors' burn centre in Birmingham, UK. It is commonly accepted that burns taking longer than 3 weeks to heal have a much higher rate of hypertrophic scarring than those that heal more quickly. However, some patients develop hypertrophic scars despite healing within this 3-week period. The authors performed a prospective study of 383 paediatric burns treated non-operatively at a regional burns centre over a 2-year period from May 2011 to April 2013. Scar assessment was performed by a senior burns therapist using the Vancouver Scar Scale. Overall rates of hypertrophic scarring were 17.2%. Time to healing was the strongest predictor of developing hypertrophic scarring, and the earliest hypertrophic scar developed in a patient who was healed after 8 days. The risk of hypertrophic scarring was multiplied by 1.138 for every additional day taken for the burn wound to heal. There was a trend towards higher rates of hypertrophic scarring in non-white skin types but this did not reach statistical significance. The risk of hypertrophic scarring increases with every day and, therefore, every effort should be made to get the wound healed as quickly as possible, even within the traditional 3-week period usually allowed for healing. The authors believe that the traditional dogma of aiming for healing within 3 weeks is overly

simplistic and should be abandoned: in paediatric burns, every day counts.

Chipp E et al.
Burns & Trauma, 5(3) DOI: 10.1186/s41038-016-0068-2, 2017

FORTY-YEAR FOLLOW-UP OF FULL-THICKNESS SKIN GRAFT AFTER THERMAL BURN INJURY TO THE VOLAR HAND

The hands often suffer severe thermal burn injuries. Resulting contractures can lead to a significant loss of function, and require burn contracture release and skin grafting to restore hand function. In this article from the USA, the authors report a case in which surgical reconstruction of a volar hand burn was performed with full-thickness skin grafting. The patient had a 40-year follow-up to assess the function and cosmesis of the repaired hand. In 1976, a 15-month-old boy presented with third-degree burns to the left volar hand, including the flexural aspects of the index, long, and ring fingers after he had placed it on a hot kitchen stove burner. The patient subsequently underwent scar contracture release and full-thickness skin grafting. Eleven years after reconstruction, further contractures developed associated with the patient's growth, which were reconstructed with repeat full-thickness skin graft from the inguinal region. No recurrence was witnessed afterward and 40 years after initial injury, the patient maintains full activities of daily living and use of his hand in his occupation. There is debate regarding the superiority of split-thickness versus full-thickness grafts during reconstruction. The authors conclude that their case strengthens the argument for durability of a full-thickness skin graft following thermal burn injury.

Weeks D et al.
Epilasty, 16: e21, 2016

AN EDUCATIONAL BOARD GAME FOR LEARNING AND TEACHING BURN CARE: A PRELIMINARY EVALUATION

It has been demonstrated that timely and effective assessment, resuscitation and transfer of patients with severe burns improves outcome. A dedicated one-day course exists to equip frontline emergency healthcare workers with the knowledge and skills needed to manage severe burn injuries. More recently, a board game was developed as a learning and practice development tool for those managing burn injuries. In this paper, the authors present the findings of their preliminary evaluation of this game. They played it with a multidisciplinary group of staff including doctors, nurses and therapists at the Mersey Regional Burn Centre (UK). Some of the participants had previously completed the Emergency Management of Severe Burns (EMSB) course. The authors obtained subjective results from a questionnaire, using both Likert-type ratings and open-ended questions. The styling of the game and ease of instructions was rated from 'average' to 'excellent'. The relevance of questions was rated from 'good' to 'excellent'. The usefulness of the game to increase knowledge and stimulate discussion was rated between 'good' and 'excellent'. All participants stated that they would recommend the game to other healthcare professionals. This is the only burns and plastic surgery-related educational game in the literature. Educational

games adhere to principles of adult learning but there is insufficient evidence in the literature to either confirm or refute their utility. Following this preliminary evaluation, the authors conclude that the game achieves its main aims, namely to increase knowledge in burn care and to stimulate discussion. Further work to assess the board game is required.

Whittam AM et al.
Scars, Burns & Healing, 3(1): 1-5, 2017

RECENT TRENDS IN BURN EPIDEMIOLOGY WORLDWIDE: A SYSTEMATIC REVIEW

The authors of this paper conducted a literature review to provide an overview of current trends in burn epidemiology across the world. Burns have generally been more prevalent among low socioeconomic populations and in less developed regions. Incredible advances in burn care and social development over recent decades, however, should have placed the incidence and severity of burns in a downward trend. The authors took into account the socioeconomic development of countries that published the epidemiological data used in this study when comparing results. They found that there has been a worldwide downward trend in burn incidence and injury severity, as well as in length of hospital stay and mortality rate. These findings were particularly pronounced in very highly developed countries. Data from highly and medium developed countries were more heterogeneous. No studies could be obtained from low- and middle-income countries. Comparisons between the different studies were compromised by the fact that studies emerged from specialized facilities on one hand and general hospitals on the other. Moreover, the studies frequently focused on limited patient populations such as “children” or “the elderly”. The authors conclude that there is a need for an international burn database with a minimal data-set in order to obtain objective and comparable results regarding burn epidemiology.

Smolle C et al.
Burns, 43(2): 249-257, 2017

REVIEW OF RECENT LARGE-SCALE BURN DISASTERS WORLDWIDE IN COMPARISON TO PREPAREDNESS GUIDELINES

The US National Bioterrorism Hospital Preparedness Program indicates that every care facility must have “a plan to care for at least 50 cases per million people for patients suffering burns or trauma” to receive national funding disaster preparedness. The purpose of this study is to evaluate whether this directive is commensurate with the severity of recent burn disasters, both nationally and internationally. The authors conducted a review of medical journal articles, investigative fire reports and media news sources for major burn disasters dating from 1990 to the present day. They defined a major burn disaster as any incident with ≥ 50 burn injuries and/or ≥ 30 burn-related deaths. They compared existing preparedness guidelines with the magnitude of recent burn disasters using as reference the 2005 U.S. Health and Human Services directive that each locale must “have a plan to care for at least 50 cases per million people for patients suffering burns or trauma.” They reported the number of actual casualties for each incident, and estimated the number of burn beds theoretically

available if the “50 [burn-injury] cases per million people” directive were to be applied to metropolitan areas outside the United States. Seven hundred and fifty-two burn disaster incidents met their inclusion criteria. The majority of burn disasters occurred in Asia/Middle East. The incidence of major burn disasters from structural fires and industrial blasts remains constant in high-income and resource-restricted countries during this study period. The incidence of terrorist attacks increased 20-fold from 2001 to 2015 compared with 1990 to 2000. The authors conclude that if current preparedness guidelines were to be adopted internationally, local resources including burn-bed availability would be insufficient to care for the total number of burn casualties. Their findings underscore an urgent need to organize better regional, national and international collaboration in burn disaster response.

Dai A et al.
Journal of Burn Care & Research, 38(1): 36-44, 2017

OPIUM ADDICTION AND MORTALITY AMONG BURN PATIENTS

It has been estimated that there are three million individuals with drug dependency in Iran, opium smoking being the most common form of substance abuse. Opium addiction is a major issue amongst burn patients in Iran. A few studies have addressed interactions between burn and addiction. In this study the authors compared mortality and morbidity between addicted and non-addicted patients with burn injuries. They conducted a prospective paired matched-cohort study from October 2012 to July 2013 at the Burn Unit of Mashhad University of Medical Sciences in Iran. One hundred and fifty-two burn patients (64% of 237) were matched in pairs based on age, gender, total body surface area and burn thickness. Mortality and morbidity was compared between the two groups using the McNemar test, the conditional logistic regression model and the Kaplan-Meier method. Fourteen (9.2%) patients died at the burn unit. The McNemar test found statistically significant differences in mortality between the two groups. Survival analysis using the Kaplan-Meier method revealed that the estimated mean survival time was 59.02 (CI 95%: 41.83 - 76.21) for non-addicted patients and 118.78 (CI 95%: 106.52 - 131.04) for addicted patients. The odds ratio for mortality was 0.524 (CI 95%: 0.167 - 1.64) times greater for addicted patients compared with non-addicted patients. Addiction in burn patients could be considered as a factor against mortality that deserves further study. Moreover, addicted patients did not show significantly higher morbidity than non-addicted patients. The authors conclude that more in-depth exploration into the interaction between burns and addiction is required.

Motamedolshariati M et al.
International Journal of High Risk Behaviors and Addiction, 5(4): e28472, DOI: 10.5812/ijhrba.28472, 2016

INACCURATE, INADEQUATE AND INCONSISTENT: A CONTENT ANALYSIS OF BURN FIRST AID INFORMATION ONLINE

More and more people are using the Internet as a source of health-related information. Burn first aid information on the Internet is often inaccurate and inconsistent. In this paper, the

authors present their findings from a website content analysis to assess the accuracy and quality of the information available. Using the search term 'burn first aid' in four popular search engines, the first 10 websites from each search engine were recorded. Fourteen websites were evaluated after removing duplicates. Four independent reviewers assessed the websites for content accuracy with checks conducted on inter-rater reliability. Website quality was recorded based on Health on the Net Code of Conduct (HONcode) principles. Country of origin for the 14 websites was the US (7), Australia (6) and New Zealand (1). The mean content accuracy score was 5.6 out of 10. The mean website quality score was 6.6 out of 12. Australasian websites scored lower for quality but higher for accuracy. The US websites scored higher for quality than accuracy. Website usability and accuracy in a crisis situation were also assessed. The median crisis usability score was 3 out of five, and the median crisis accuracy score was 3.5 out of five. The authors conclude that the inaccurate and inconsistent burn first aid treatments that appear online are reflected in the often-incorrect burn first aid treatments seen in patients attending emergency departments. The public need consistent messages about correct burn first aid information.

Burgess JD et al.
Burns, 42(8): 1671-1677, 2016

MORTALITY ESTIMATES IN ELDERLY BURNS: A NORTHERN IRELAND REGIONAL UPDATE

Mortality among thermally injured elderly patients remains a challenge for burns surgeons. The aim of this audit was to provide an update on region-wide Northern Irish (NI) mortality estimates in elderly burns patients with comparison to previously reported local data (1996-2005). A six-year (01/01/10 - 31/12/15) retrospective case note and electronic care record review was conducted on all patients over 65 years admitted to the Regional NI Burns Unit. The primary outcome measure was mortality rates represented by LA50 score. Secondary outcome measures were median burn size, presence of inhalation injury and admission to ICU. Ninety-six patients (51M: 45F) were identified compared with 143 (65M: 78F) in the earlier study. Mean age (75 vs. 76.7 years), median burn size (2 vs. 3% TBSA) were comparable. Only 6 patients sustained a burn >15% TBSA compared with 21 patients in the earlier study. Admissions to the ICU (12 vs. 14), inhalation injuries (7 vs. 10) and LA50 score (22 vs. 21) were all comparable. Despite a 33% increase in size of the >65 year population between 1996-2015, these data would suggest a reduction in the severity of thermal injury with comparable mortality estimates.

Clements JM et al.
International Journal of Surgery, 36(1): S95, 2016

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Burn in the Prehospital Setting
Tom Potokar

Burns in Conflict Introduction
Assessment

Practical assessment
Initial management
Initial management:
Interactive examples
Prioritizing principles
Prioritizing exercise

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▼ MBC session: Conflict related burns

- 09:00 **US Army battlefield approach**
Leo Cancio, USA
- 09:22 **Burn treatment in refugee and humanitarian crisis**
Bisharah Atiyeh, Lebanon
- 09:44 **MBC-WHO collaboration and MBC humanitarian action**
Michele Masellis, Italy
- 10:06 **WHO perspective: burns in the third world: an unmet need**

SYSTEMATIC REVIEW OF COMPLICATIONS AND OUTCOMES OF DIABETIC PATIENTS WITH BURN TRAUMA

The aim of this paper was to understand the effect diabetes plays on the extent of complications and patient outcome in burn trauma. The authors searched MEDLINE, Science Direct and the Cochrane Review Database and identified 12 articles for systematic review and meta-analysis. Data were analysed via Review Manager 5.3, using Mantel-Haenszel statistics and random effect models. Results showed that the odds a diabetic patient sustained a wound or local infection was 2.55 times higher (95%CI: 1.21–5.36, $Z = 2.47$; $p = 0.01$), with a low heterogeneity ($\text{Tau}^2 = 0.00$; $I^2 = 0\%$). Diabetics also had a greater chance of contracting a urinary tract infection (OR = 3.32 (95% CI: 1.92–5.73; $Z = 4.31$, $p < 0.001$), with low heterogeneity ($\text{Tau}^2 = 0.00$; $I^2 = 0\%$)). In terms of length of hospital stay, the mean difference between diabetic and non-diabetic patients was 3.94 (95% CI: -2.69 to 10.6; $I^2 = 98\%$; $p = 0.24$). Regarding

ing mortality rates, the odds ratio between diabetic and non-diabetic patients was 2.22 (95% CI: 0.45–10.9; $I^2 = 93\%$; $p = 0.32$). They also found that diabetic patients are more prone to nosocomial wound infections (OR = 2.26; 95% CI = 1.10–4.64), cellulitis (OR = 2.69; 95% CI = 1.85–3.91), bacteraemia (OR = 2.91; 95% CI = 1.48–5.73), sepsis (OR = 4.36; 95% CI = 2.20–8.64), a higher number of burn related operations (OR = 3.94; 95% CI = 1.94–7.90), longer period for wound closure (MD = 26.8; 95% CI = 8.52–45.1), respiratory complications (OR = 2.91; 95% CI = 1.35–6.28) and a higher number of days on the ventilator (MD = 8.70; 95% CI = 3.51–13.89). The authors conclude that diabetic patients are more likely to sustain a wound infection, local infection and urinary tract infection. However, they did not have higher odds for longer hospital stay or mortality.

Sayampanathan AA
Burns, 42(8): 1644-1651, 2016

BURN IN THE PREHOSPITAL SETTING - MAY 11-13, 2017 - BEIRUT, LEBANON

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WKSHP 3: Burn in the Pre-hospital Setting

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Tom Potokar

FRCS(ed), FRCS(Plast), DA(UK), DTM&H
Director Interburns
Chair in Global Burn Injury Policy & Research
College of Human and Health Sciences
University of Swansea – Wales

12:30 - 12:45	Burns in Conflict Introduction
12:45 - 1:15	Assessment
1:15 - 1:35	Practical assessment
1:35 - 1:55	Initial management
1:55 - 2:15	Initial management: Interactive examples
2:15 - 2:30	Prioritizing principles
2:30 - 2:45	Prioritizing exercise