EARLY ASSESSMENT AND IDENTIFICATION OF POSTTRAUMATIC STRESS DISORDER, SATISFACTION WITH APPEARANCE AND COPING IN PATIENTS WITH BURNS

In this article from Sweden, the authors investigate PTSD, BID and coping in burn patients at three, six and twelve months after discharge. The first year after suffering a severe burn is a psychologically challenging period for the patient, who may still struggle with burn-related physical and psychological problems such as posttraumatic stress disorder (PTSD) and body image dissatisfaction (BID). The aim of the study was to identify patients in need of focused support during rehabilitation. Fifty-two adult patients with different degrees of burns were followed at three, six and twelve months after discharge and 36 patients completed all assessment points. A standardized clinical protocol was used for systematic assessment of PTSD (IES-R), BID (SWAP-Swe) and Coping (CBQ). The follow-up included an intervention with a burn nurse as a complement to the existing program. Results showed that approximately half of the patients had a risk of developing PTSD three months after discharge from hospital, and body image dissatisfaction was found to potentially predict risk of PTSD during follow-up. The findings suggest that it is important to include patients with less extensive burns in follow-up as this group is at risk of developing PTSD. Using standardized questionnaires in early follow-up along with assessment of body image dissatisfaction may help detect psychological problems.

Dahl O. et al.
Burns, 42(8): 1678-1685, 2016

QUANTITATIVE ANALYSIS OF ESTIMATED BURN SIZE ACCURACY FOR TRANSFER PATIENTS

The objective of this study was to quantify differences between estimated TBSA from referring hospitals vs. calculated TBSA in the burn unit in regards to several variables. The authors conducted a retrospective review of 735 burn patients admitted over a 17-month period. Three hundred and twenty-six patients fit the criteria of transfers with recorded %TBSA estimations from referring hospitals. Referring %TBSA was compared with actual %TBSA, and the difference was expressed as a percentage of actual %TBSA. This was then used to group referring estimations as underestimated (less than -25%), satisfactory (-25 to 25%), or overestimated (greater than 25%). A paired t-test was used to assess the paired differences for significance. Secondary variables were then assessed between groups. When assessing associations of these clinical measures, a one-way analysis of variance was used for continuous variables and Pearson’s χ test or Fisher’s exact test was used. Of the 326 patients analysed, 13 were underestimated, 63 were satisfactory, and 250 were overestimated. The ratio of overestimation to underestimation exceeded 19.1, and the ratio of overestimation to satisfactory estimation was nearly 4:1, with a statistically significant difference in referred %TBSA and actual %TBSA (P < .0001). Within the over and underestimated groups, there were significant differences between referred %TBSA and actual %TBSA (P < .0001). Larger burns were more accurately estimated (P < .0001). There are significant inaccuracies between referring hospital estimated %TBSA and actual %TBSA, which consistently and grossly skew toward overestimation. Inaccuracy in burn size estimation is systemic and can affect patient care and burn unit efficiency.

Armstrong J.R. et al.

COMPARISON OF THREE COOLING METHODS FOR BURN PATIENTS: A RANDOMIZED CLINICAL TRIAL

The aim of this randomized, controlled study carried out at Seoul Bestian Hospital in South Korea from June 2015 to October 2015 was to compare the cooling effects of three burn-cooling methodologies: running tap water, Burnshield® and Burn Cool Spray®, and suggest indications for each cooling method. Ninety-six patients with burns who used the hospital’s emergency services were enrolled in the study. The allocation of the cooling methods was randomly generated using a computer. Burn wounds were cooled with one of the three methods, and skin surface temperature and pain level were measured using a visual analog scale (VAS) scoring. The authors found that tap water and Burn Cool Spray® reduced the skin surface temperature, but the Burnshield® slightly increased it. All three cooling methods were effective in relieving pain. The temperature of the tap water used was related to the reduction in skin surface temperature and VAS pain score. The patients who visited the hospital within 30 minutes of their burn accident needed a longer cooling time to attain a comparable skin surface temperature to those who visited after 30 minutes.

Young Soon Cho & Young Hwan Choi
Burns, 43(3): 502-503, 2017
Admission hyperglycemia predicts infectious complications after burns

Inflammation and hypermetabolism post burn predisposes to hyperglycemia and insulin resistance. The authors of this article from the USA hypothesize that admission hyperglycemia predicts infectious outcomes. A retrospective review of all patients over 20 years of age admitted for initial burn management from January 2008 to December 2013 was conducted. Hyperglycemia was defined as admission glucose ≥150 mg/dl. Patients were grouped as follows: euglycemic without diabetes (control), euglycemic with diabetes (−H+D), hyperglycemic without diabetes (+H−D), and hyperglycemic with diabetes (+H+D). Outcomes included infection, mortality, length of stay and disposition. Results revealed that all three groups had higher mortality compared with controls. Longer hospital stays were noted only in +H−D. +H−D and +H+D were less likely to be discharged home than controls. +H−D had higher rates of bacteremia, +H−D and +H+D had higher rates of pneumonia, and −H+D and +H−D had higher rates of urinary tract infection. Regression for infection and mortality outcomes with TBSA, age, diabetes, hyperglycemia, obesity, race, gender and inhalation injury as covariates was performed. Hyperglycemia was the only independent predictor of bacteremia. Hyperglycemia was also a predictor of pneumonia and urinary tract infection. The only independent predictors of mortality were age, TBSA, and inhalation injury. Acute glucose dysregulation may be more important than diabetes in predicting infectious outcomes after burns. The authors conclude that admission glucose may have prognostic value.

Ray J.J. et al.

Cost analysis of 48 burn patients in a mass casualty explosion treated at Chang Gung Memorial Hospital

This study was performed to investigate the economic effects of treating burn patients at a single medical centre after an explosion disaster. A devastating Color Dust explosion that injured 499 patients occurred on June 27, 2015 in Taiwan. A detailed retrospective analysis on 48 patient expense records at Chang Gung Memorial Hospital after the Color Dust explosion was performed. Data were collected during the acute treatment period between June 27, 2015 and September 30, 2015. The distribution of cost drivers for the entire patient cohort (n = 48), patients with a percent total body surface area burn (%TBSA) ≥ 50 (n = 20), and those with %TBSA <50 (n = 28) were analysed. The authors found that in response to this mass casualty event, inpatient ward fees represented the largest expense. They conclude that hospitals can reduce this fee by ensuring wound dressing and skin substitute materials are regionally stocked and accessible. Medication fees may be higher than expected when treating a mass burn cohort. In preparation for a future event, hospitals should anticipate that patients with a %TBSA ≥ 50 will represent the majority of inpatient expenses.

Mathews A.L. et al.
Injury, 48(1): 80-86, 2017

Anxiety, depression and PTSD-related symptoms in spouses and close relatives of burn survivors: when the supporter needs to be supported

The aim of this study conducted in Canada was to assess the prevalence of anxiety, depression and PTSD-related symptoms reported by spouses and close relatives of adult burn survivors. Potential associations between these symptoms and variables such as the severity of the burn were also explored. Thirty-one spouses and 25 close relatives of hospitalized burn patients were enrolled in the study. Anxiety and depression symptoms were assessed by the Hospital Distress Anxiety and Depression Scale and PTSD-related symptoms by the Modified PTSD Symptom Scale at both admission to and discharge from the burn unit. The authors found that spouses and close relatives of burn survivors have high levels of psychological distress in the first few days following admission, and more than a quarter still reported symptoms in the clinical range at discharge. They conclude that there is a need to offer psychological support and guidance to family members so that they can in turn provide effective support to the burn survivor.

Bond S. et al.
Burns, 43(3): 592-601, 2017

Energy poverty, shack fires and childhood burns

Burn injuries are a persisting challenge in South Africa. Energy poverty, prevalent in under-resourced communities, is a key contributor to the problem. The energy-poor rely on solid fuels and flammable hydrocarbons, such as paraffin, for energy services. The fuels are burnt in inefficient, leaky and unstable appliances, leading to health losses from pollutant emissions, burns and conflagrations. Within cramped informal home settings, using flammable fuels and risky combustion technologies, the situation can become devastating, especially for young children. Those who survive incidents have to contend with trauma and property losses that may lead to further impoverishment. Proactive intervention strategies are required and should include the broadening of access to safe and sustainable energy. We advocate greater enforcement of home appliance standards and targeted support for the distribution of proven alternative energy technologies, such as liquefied petroleum gas and solar power. Support and advocacy from professional and citizen groups would be necessary to ensure that government prioritises the safe energy requirements of poor citizens.

Kimemia D.K. & van Niekerk A.

Review of the initial treatment and avoidance of scald injuries

Scald injuries, which describe burns to living tissue from hot liquids, are very common injuries that occur across geographical, social, economic and national boundaries. Despite their ubiquitous nature, a complete understanding of the conditions that are required to cause scald burns is not yet available. Clear guidance to medical practitioners is available through var-
ious guidelines, however, in actual situations, the extent of the burn is not fully known and this lack of knowledge complicates care. Here, the authors conduct a comprehensive review of the available knowledge of temperatures and scald durations which lead to skin-burn injuries. The range of volumes and liquid temperatures are typical of those found in heated consumer beverages. The authors believe that this review can help medical practitioners design initial treatment protocols and can be used by manufacturers of hot-liquid products to avoid the most severe burns. Subsequently, within the context of this ability to quantify burn depths, a review of current burn treatment guidelines is presented. This includes a visual recognition of the extent of burns into the dermal layer as well as decision guidelines for selection of patients who would benefit from referral to a dedicated burn centre. The authors hope that by bringing together both the quantified burn-depth information and current treatment guidelines, the review can be used as a resource for people in the medical, manufacturing, beverage service and other industries to reduce the human impact of scald injuries.

Bourdon R.T. et al.
World J Dermatol, 6(2): 17-26, 2017

INcidence and clinical outcome of hypophosphatemia in pediatric burn patients

The authors report the results of a study to investigate the factors associated with serum phosphate concentrations in severely burned children and whether hypophosphatemia is associated with outcome. It was conducted in the Department of Pediatrics, Hospital do Servidor Público Estadual de São Paulo, São Paulo, Brazil. Seventy-eight children with a total body surface area of 24% (6.0–68.5) were retrospectively analyzed for serum phosphate concentrations during the first 10 days of stay in the intensive care unit (ICU). The method of generalized estimating equations was used to evaluate the effect of the exposure variables for serum phosphate concentrations during the study period. Outcome variables were the probability of ICU discharge at 30 days and time on mechanical ventilation. Potential explanatory variables for clinical outcome were hypophosphatemia (serum phosphate <3.8 mg/dL for children <2 years and <3.5 mg/dL for older children), age, sex, percentage total body surface area burn, inhalation injury and severe sepsis and/or septic shock. Competing-risk analysis was applied to calculate the probability of ICU discharge at 30 days, and death was assumed as the competing event. The rate of hypophosphatemia was 79.5%. Serum phosphate concentrations were associated with C-reactive protein (coefficient: −0.63; 95% confidence interval [CI]: −0.96 to −0.30; P = .001). Hypophosphatemia was independently associated with a 68% decrease in the probability of ICU discharge at 30 days (subhazard ratio: −0.32; 95% CI: 0.20, 0.53; P = .001) and an increase of 2.9 days in mechanical ventilation (coefficient: 2.91; 95% CI: 1.16, 4.66; P = .001). Serum phosphate concentrations in pediatric burn patients are associated with the magnitude of inflammatory response. Hypophosphatemia is associated with decreased probability of ICU discharge and increased time on mechanical ventilation.

Leite H.P. et al.
J Burn Care Res, 38(2): 78-84, 2017

Antimicrobial peptide epinecidin-1 promotes complete skin regeneration of methicillin-resistant Staphylococcus aureus-infected burn wounds in a swine model

This report shows that the antimicrobial peptide (AMP) Epinecidin-1 (Epi-1) efficiently heals MRSA-infected heat burn injuries and provides protection from infection in a pig model. The presence of an optimal level of Epi-1 induces cell proliferation by promoting cell cycle progression through an increase in S-phase cells. Epi-1 also induces proliferation to cover the wounded region in an in vitro cell proliferation assay using immortalized human epithelial HaCaT cells. Next, the in vivo wound healing efficiency of Epi-1 was tested in heat-burned pig skin infected with MRSA under in vivo conditions. Treatment of the injury with Epi-1 for 1 h at six hours post-infection completely healed the wound within 25 days. Conversely, the injury in the untreated control was not healed 25 days post-infection. Histological staining of wound sections with H&E showed that Epi-1 enhanced vascularization and increased epithelial activities in the wound region. Neutrophil recruitment to the wounded region in the Epi-1-treated sections was visualized by Giemsa staining. Additionally, Masson’s trichrome staining of wound sections confirmed that Epi-1 enhanced extracellular collagen compound formation. The induction of sepsis-associated blood C-reactive protein (CRP) and the pro-inflammatory cytokine IL-6 in response to MRSA infection was also suppressed in pigs that received Epi-1. Taken together, the results demonstrate that the biomaterial Epi-1 heals wounds through increasing epithelial cell proliferation, vascularization and the formation of collagen, and controls MRSA infection-mediated sepsis in pigs.

Han-Ning Huang et al.
Oncotarget, 8: 21067-21080, 2017

Burn leads to long-term elevated admissions to hospital for gastrointestinal disease in a west Australian population-based study

The objective of this study was to assess if burns are associated with increased long-term admissions for gastrointestinal diseases. A population-based longitudinal study using linked hospital morbidity and death data from Western Australia was undertaken of adults aged at least 15 years when hospitalized for a first burn (n = 20,561) in 1980–2012. A frequency matched non-injury comparison cohort was randomly selected from Western Australia’s birth registrations and electoral roll. The authors found that, after adjustment for demographic factors and pre-existing health status, the burn cohort had 1.54 times (95% confidence interval [CI]: 1.47–1.62) as many admissions and almost three times the number of days in hospital with a digestive system diagnosis (IRR, 95% CI: 2.90, 2.60–3.25) than the uninjured cohort. Significantly elevated adjusted post-burn incident rates were identified, with the risk decreasing with increasing time. The authors conclude that their findings showing increased hospital admission rates and prolonged length of hospital stay for gastrointestinal diseases in the burn cohort provide evidence that burns have effects that persist long after the initial injury.

Stevenson A.W. et al.
Burns, 43(3): 665-673, 2017
THE EFFECTS OF PUNICA GRANATUM FLOWER EXTRACT ON SKIN INJURIES INDUCED BY BURN IN RATS

Several studies have examined the efficacy of herbal medicines for healing wounds. The authors of this article compared the efficacy of P. granatum (P) flower extract with that of silver sulfadiazine (SSD) for treating thermal burn injuries in rats. Ten Wistar rats in each group were topically given base cream, normal saline, cream containing 1% SSD, or creams containing 5% or 10% P. granatum flower extract. The treatments were administered once daily until complete wound healing was observed. Wound area and healing time were assessed. In addition, percentage wound contraction and histopathological characteristics such as neovascularization and collagen formation were determined. The tannin content in P. granatum extract was determined. The decrease in the average size of wounds on day 15 of treatment was higher in rats treated with creams containing P. granatum extract than in rats treated with cream containing SSD. The wounds completely healed on day 25 of the treatment in rats treated with creams containing P. granatum flower extract compared with those in rats treated with the other agents. The authors conclude that these results indicate that P. granatum flower extract promotes wound healing in rats and could be used for managing burn injuries.


EARLY MANAGEMENT OF PAEDIATRIC BURN INJURIES

Burns are a common form of trauma in children, resulting most frequently from scalds but also contact, flame, electrical and chemical sources. Burn patients have a wide spectrum of injury severity and diverse outcome, ranging from superficial burns with no lasting physical signs to deep, large body surface area burns that are profoundly life-changing, affecting all physiological systems. Size, site and depth are important factors affecting treatment and outcome. There are important anatomical, physiological and psychosocial differences between adults and children. Their body proportions are different, they have thinner skin, smaller airways, reduced blood volume and high levels of distress. They are vulnerable to non-accidental injury. Children require formal fluid resuscitation and maintenance fluids for burns more than 10% total body surface area. Complications include infection, toxic shock syndrome, adverse scarring and psychological sequelae. This paper discusses how correct assessment and management in the acute stage can reduce later morbidity and mortality.

Gill P. & Falder S. Paediatrics & Child Health, doi.org/10.1016/j.paed.2017.03.011

WHAT CAN WE LEARN FROM THE DISSEMINATION OF CARBAPENEM-RESISTANT ACINETOBACTER BAUMANNII IN PATIENTS WITH BURN INJURY?

A. baumannii is an important pathogen causing various nosocomial infections, and has become one of the most commonly isolated pathogens in burn patients. Outbreaks and rapid dissemination of CRAB strains despite prevention and control measures have been reported worldwide, and most commonly occur in intensive care units. The spreading of multidrug-resistant A. baumannii (MDRAB), especially CRAB, has become a threat to public health. In this article the author characterizes the antimicrobial susceptibility pattern, resistance mechanisms, and typing of carbapenem-resistant Acinetobacter baumannii (CRAB) isolates obtained from burn patients from a single center in Iran. He found that the rate of CRAB was high (92.5%) among burn patients. The most effective drugs with in vitro activity against A. baumannii isolates in this study were colistin, polymyxin B and ampicillin–sulbactam.

Yi-Tsung Lin J Chin Med Assoc, 80(4): 189-190, 2017

COLD BURN INJURIES IN THE UK: THE 11-YEAR EXPERIENCE OF A TERTIARY BURNS CENTRE

This study aimed to review the etiology and management of all cold burns presenting to a large regional burn centre in the UK and to provide a simplified management pathway for cold burns. Guidance for the management of cold burn injuries is not widely available. The authors conducted an 11-year retrospective analysis (1 January 2003–31 December 2014) of all cold injuries presenting to their burn centre. Twenty-three patients were identified. Case notes were reviewed for injury mechanism, first aid administered, treatment outcomes and time to healing. An anonymous nationwide survey on aspects of management of cold burns was disseminated between 13 July 2015–5 October 2015 to the British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS) and Plastic Surgery Trainees Association (PLASTA) members in the UK. The authors received 52 responses from a total of 200 questionnaires. Ninety percent of respondents think clearer guidelines should exist. Electronic searches of MEDLINE, EMBASE and the Cochrane Library were performed to identify relevant literature to provide evidence for a management pathway for cold burn injuries. The authors conclude that their findings reflect a gap in clinical knowledge and experience. They propose a simplified management pathway for managing cold burn injuries, consisting of adequate first aid using warm water, oral prostaglandin inhibitors, deroofing of blisters and topical antithromboxane therapy.