Original article:

Analysis of Management of Burns with Conventional Heparin at a Tertiary Care Hospital: A Clinical Study

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ABSTRACT

Background: Burns are one of the most devastating forms of trauma worldwide. The present study was conducted to assess cases of burns managed with topical heparin.

Materials & Methods: The present study was conducted on 58 patients of burns of both genders. Wounds were left exposed and received 4,200 UI of heparin for each 1% of affected body surface three times daily until the crusts appeared. Heparin's analgesic efficacy and tolerability was evaluated by the analgesics´ demand and response to the pain Visual Analog Scale.

Results: There were 26 males and 32 females. The mean requirement for rescue analgesics on 1st day was 1.47, on 7th day was 0.76, on 15th day was 0.52 and on 21st day was 0.00. The difference was significant (P< 0.05). The VAS score was assessed and compared in day 1, day 7, day 15 and day 21 in both groups. On 1st day, it was 1.18, on 7th day, it was 0.69, on 15th day, it was 0.48 and on 21st day, it was 0.00. The difference was significant (P<0.01).

Conclusion: Authors found that conventional treatment with heparin is effective in management of burns.

Keywords: Burn, Heparin, VAS.

INTRODUCTION

Burns are one of the most devastating forms of trauma worldwide. In the elderly, flame and scald burns, or scalds alone, are the major causes of burns, most commonly occurring at home, particularly in the kitchen and bathroom.[1] While geriatric burns are uncommon in the developing world - accounting for less than 5% of burns in South East Asian and Middle Eastern countries - they represent about 20% of burns in economically developed countries.[2] Burn injuries are a significant problem with more than 500,000 people seeking medical treatment, 40,000 resultant hospitalizations, and 4000 deaths per year in the United States. The annual cost of treating these burns is estimated to be in excess of U.S. $ 1 billion, not including the indirect costs of disability and rehabilitation.[3] These statistics have driven a multitude of studies that have systematically began to uncover the intricate mechanisms involved in burn and the complex pathophysiology of burn injury. Numerous mediators in these pathways have been the subject of animal studies in an attempt to find improved clinical therapies for treatment of burn injury.[4]

Heparin has been treatment of choice since years. Topical, intravenous, subcutaneous, inhalation, and in membranes are different routes of heparin administration. It has anti-inflammatory and angiogenic properties that do not depend on its well-known anticoagulant action.[5] The present study was conducted to assess cases of burns managed with topical heparin.

MATERIALS & METHODS

The present study was conducted in the Department of General Surgery, Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh, India. It comprised of 58 patients of burns of both genders. The study was approved from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

Data such as name, age, gender etc. was recorded. Wounds were left exposed and received 4,200 UI of heparin for each 1% of affected body surface three times daily until the crusts appeared. We used spray with 10,000 UI of unfractionated heparin per mL. Each spray releases 0.14 mL of the product, corresponding to 1,400 UI of heparin. Patients received daily hygiene care in bed. Heparin's analgesic efficacy and tolerability was evaluated by the analgesics´ demand and response to the pain Visual Analog Scale. Results obtained were tabulated and analyzed using chi- square test. P value<0.05 was considered significant.

RESULTS

Table I shows that there were 26 males and 32 females in present study. Table II shows that mean requirement for rescue analgesics on 1st day was 1.47, on 7th day was 0.76, on 15th day was 0.52 and on 21st day was 0.00. The difference was significant (P< 0.05). Table III, graph I shows that the VAS score was assessed and compared in day 1, day 7, day 15 and day 21 in both groups. On 1st day, it was 1.18, on 7th day, it was 0.69, on 15th day, it was 0.48 and on 21st day, it was 0.00. The difference was significant (P<0.01).

Table I: Distribution of patients

Total- 58		
Gender	**Male**	**Female**
Number	26	32

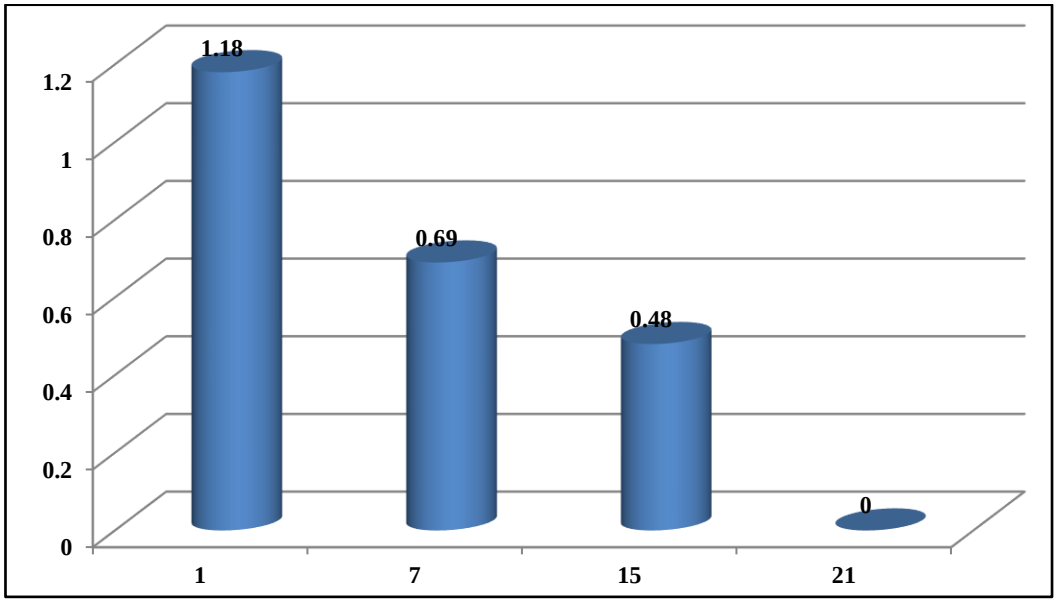
Table II: Daily requirement for rescue analgesics

Day	**Mean**	**P value**
1	1.47 ± 1.32	0.01
7	0.76 ± 0.68	
15	0.52 ± 0.14	
21	0.00 ± 0.00	

Table III: Visual analogue scale

Day	**Mean**	**P Value**
1	1.18 ± 1.02	0.01
7	0.69 ± 0.24	
15	0.48 ± 0.15	
21	0.00 ± 0.00	

Graph I: Visual analogue scale



DISCUSSION

Burn has high mortality and morbidity rates not only in India, but worldwide. There can be many reasons for burns. It can be due to dry heat or fire burns normally causing varying areas of deep skin loss, chemical burns, electrical burns, hot fluids or scalds with burns of a widespread more superficial nature, radiation burns, flash burns of short duration but intense heat.[6] Management of burns is a challenging task. Various local remedies include application of savlon solution and betadine and flamazine. The wounds are normally covered with gauze dressings and bandages. Skin grafting is done to cover the burned area as soon as possible. Split thickness skin graft is the first choice but biological dressings like porcine or cadaver skin can be used if operation must be delayed due to systemic illness.[7] The present study was conducted to assess cases of burns managed with topical heparin.

In present study, there were 26 males and 32 females. Saliba et al[8] found that mean burn size (9.6% TBSA) and percent with inhalation injury (11.3%) did not markedly differ by age. Men predominated overall (ratio 1.4:1), although women (4290) outnumbered men (3439) in the oldest age category. Length of stay per TBSA and median hospital charges increased with increasing age category, suggesting higher resource consumption with aging. Mean number of operations per patient, however, decreased with age. Mortality rates and discharge to non-independent status increased with age. By logistic regression, the adjusted odds ratio for mortality was 2.3 (95% CI 2.1–2.7) in the 65 to 74 age group, and 5.4 (95% CI 4.8–6.1) in the oldest group when compared with the 55 to 64 age group. Mortality rates decreased significantly after 2001 across all age groups. This analysis demonstrates age-dependent differences in resource utilization and mortality risk within the older burn population and highlights the need for a national research agenda focused on management practices and outcomes in older adult with burns.

We found that mean requirement for rescue analgesics on 1st day was 1.47, on 7th day was 0.76, on 15th day was 0.52 and on 21st day was 0.00. The VAS score was assessed and compared in day 1, day 7, day 15 and day 21 in both groups. On 1st day, it was 1.18, on 7th day, it was 0.69, on 15th day, it was 0.48 and on 21st day, it was 0.00.

Barretto et al[9] compared demographic, etiologic, and outcome differences between male and female patients 65 years of age and older admitted for acute burn treatment during a five-year period. Elderly patients comprised 8.5% of burn admissions. Women, who accounted for 33% of burns occurring in this group, tended to have smaller (12.0% versus 17.2% total body surface area (TBSA); $p = 0.20$) and less severe (3.6% versus 9.7% 3rd TBSA; $p < 0.05$) injuries, but mortality did not differ from men. Although not significant, elderly women, who were less likely to be married, tended to stay in the hospital longer and were significantly less likely to be discharged home than men.

Venakatachalapathy et al[10] included 100 consecutive burn patients (age, 15-35 yr) with second-degree superficial and deep burns of 5-45% TBSA size. Two largely similar cohort groups, i.e. a control group (C) and a heparin group (H) with 50 subjects per group, were randomly treated, the main difference between the groups being that 13 C patients had burns of 35-45% extent vs. only one such patient in H. The 50 C patients received traditional routine treatment, including topical antimicrobial cream, debridement, and, when needed, skin grafts in the early post-burn period. The 50 H patients, without topical cream, were additionally treated, starting on day 1 post-burn, with 200 IU/ml sodium aqueous heparin solution USP (heparin) dripped on the burn surfaces and inserted into the blisters 2-4 times a day for 1-2 days, and then only on burn surfaces for a total of 5-7 days, prior to skin grafting, when needed. Significantly less intravenous fluid was infused in H: 33.5 litres in 39 H patients vs. 65 litres in 41 C patients, i.e. nearly 50% less ($p < 0.04$). The 50 H patients had four skin graftings (8%), while the 50 C patients had 10 (20%). Five 5 C patients died (mortality, 10%). No H patients died. The number of days in hospital for H vs. C was significantly less (overall, $p < 0.0001$): 58% of H were discharged within 10 days vs. 6% of C; 82% of H were out in 20 days vs. 14% of C; 98% of H vs. 44% of C were out in 30 days; and while 100% of H were discharged by day 40, 56% of C required up to another 10 days. The burns in H patients healed on average in 15 days vs. an average of 25 days in C. Procedures and costs in H were much reduced compared with C. Advances in resuscitation, operative care and grafting techniques, infection prevention and treatment, and mitigation of hypermetabolism have all improved survival and recovery.

CONCLUSION

From the above results, the authors conclude that conventional treatment with heparin is effective in management of burns. However, further studies are recommended.

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