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ROLE OF TOPICAL HEPARIN IN MANAGEMENT OF BURN WOUND

General Surgery

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ABSTRACT

Background : Burn trauma represents a major cause of morbidity and mortality, with significant drain on limited health resources. 40 patients with burns ranging from 05 to 40% TBSA were treated with topical Heparin. The burn trauma ranged from superficial to 2nd degree burns. They were all evaluated for 1 week in hospital and were followed up for a month. **Objectives Of The Study:** Heparin application is a much better treatment modality in patients of burn trauma as Heparin prevents Burn extension, promotes faster healing via neovascularization and reduces the days of hospitalization when compared to conventional treatment with Silver Sulphadiazine. **Materials And Method:** Affected body parts are exposed and cleansed with normal saline before topical application of Heparanised Sodium Solution drop by drop via 30 gauge needle. All blebs were injected with the same solution and not de-roofed. This was done for 7 days post presenting in Hospital. All patients received antibiotics twice daily and analgesics were administered once daily and SOS **Results:** Application of Heparin topically to burns patients significantly reduced the days of hospitalization, amount of analgesics and antibiotics required, also promoted neovascularization and reduced tissue edema **Conclusion:** Heparin application should be made the preferred modality of treatment for patients with more than 10%to 40% TBSA as it is better accepted by patients and reduces the post burn complications significantly.

KEYWORDS

Burn, Topical Heparin

INTRODUCTION

Background: Burn injuries primarily affect the epidermis and dermis, with 86% resulting from thermal sources. Assessment and treatment are influenced by burn type, extent, depth, patient age, health conditions, and the presence of associated injuries.

Need For Study: Heparin is recognized for its anticoagulant properties but also exhibits significant anti-inflammatory, anti-histaminic, anti-allergenic, and other therapeutic actions. In burn treatment, heparin has shown potential benefits, including pain relief, reduced tissue swelling, prevention of burn contractures, and accelerated healing via enhanced revascularization and re-epithelialization.

Aim Of The Study

To study the effects of topical heparin in the treatment of burns in a tertiary care centre.

Objective Of Study

To compare the effectiveness and efficiency of heparin against the conventional treatment methods used in the treatment of burn wounds

MATERIALS AND METHODS

The research conducted at the Rajshree Medical College and Research Institute in Bareilly, Uttar Pradesh, spanned 18 months and employed a hospital-based cross-sectional design with a sample of 40 patients, divided into two groups of 20—one receiving heparin and the other serving as a control. Approved by the hospital's medical ethics committee, all participants provided written informed consent. Inclusion criteria focused on patients aged 15 to 50 with superficial to second-degree thermal burns covering more than 5% to 50% of total body surface area (TBSA), admitted within 72 hours of trauma. Exclusion criteria included hypersensitivity to heparin, active bleeding, low platelet counts, bleeding disorders, gastric or duodenal ulcers, full-thickness burns, and infected or necrotic wounds.

Method Of Collection Of Data:

Patients with burns received daily water baths and systemic treatments, including antibiotics, analgesics, proton pump inhibitors, and IV fluids based on the Parkland Formula. The main difference was that one group received topical heparin, while the control group was treated with silver-based antimicrobial cream and paraffin gauze, with minimal debridement and no surgical interventions. The heparin solution, prepared by mixing unfractionated heparin with normal saline, was applied drop by drop to the burn surface until pain relief was achieved, monitored for healing signs over a week. Blisters were drained with the heparinized solution without de-roofing. Clotting times and bleeding profiles were closely tracked, with protamine sulfate ready to reverse any adverse effects. Initial evaluations included managing emergencies, IV cannulation, laboratory tests, and prophylactic tetanus injections, alongside analgesics and IV antibiotics.

RESULTS

Table 1: Distribution Of Groups According To Percentage Of Burn

% of Burns	Group H (Mean, SD)	Group C (Mean, SD)	p-value
5-10	29.4, 14.2	37.7, 6.7	0.397
10-20	23.9, 9.3	27.8, 10.0	0.499
20-30	47.5, 3.5	26.8, 7.7	0.017*
30-40	30.3, 10.5	32.1, 9.1	0.761

The table shows that in the 20-30 age group, there was a significant discrepancy, with Group H reporting a mean percentage of 47.5 (SD = 3.5) compared to 26.8 (SD = 7.7) in Group C, with a p-value of 0.017*. For individuals in the rest of the age group no significant difference observed.

Table 2: Pain Score On Day 5

% of Burns	Pain Score Day 5 - Group H (Mean ± SD)	Pain Score Day 5 - Group C (Mean ± SD)	p-value
5-10	2.3 ± 1.4	5.3 ± 1.2	0.010*
11-20	2.0 ± 0.0	6.2 ± 1.3	<0.001*
21-30	2.0 ± 0.0	7.2 ± 1.1	<0.001*
31-40	4.5 ± 1.0	7.7 ± 0.5	<0.001*

The pain scores on Day 5 for burns covering 5-10% of the body surface area were significantly lower in Group H compared to Group C.Similarly, for burns spanning 11-20%, Group H exhibited markedly lower pain scores (2.0 ± 0.0) compared to Group C (6.2 ± 1.3)This trend persisted for burns covering 21-30% and 31-40% of the body, where Group H consistently demonstrated lower pain scores compared

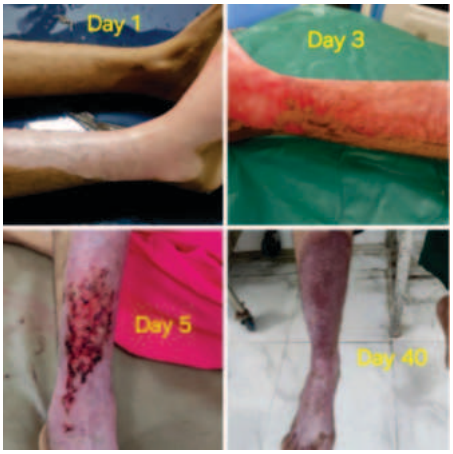
to Group C (7.Overall, the findings suggest that Group H experienced significantly less pain on Day 5 across all burn percentage categories compared to Group C, indicating the potential efficacy of the intervention in managing burn-related pain.

Table 3: Analgesic Requirement Between Study Groups

Analgesic Dosage	Group H (N, %)	Group C (N, %)	Total (N, %)
1-2 doses	18 (90%)	7 (35%)	25 (62.5%)
3-4 doses	2 (10%)	13 (65%)	15 (37.5%)
Total	20 (100%)	20 (100%)	40 (100%)

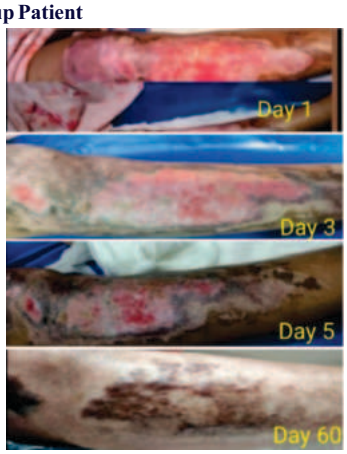
The table illustrates the distribution of analgesic dosage intake among two groups. In Group H, 90% consumed 1-2 doses of analgesics, while 10% took 3-4 doses. Conversely, in Group C only 35% opted for 1-2 doses while a significant 65% resorted to 3-4 doses, highlighting differential dosage patterns between the two groups.

Heparin Group Patient :-
Patient 1



Patient 2

Control Group Patient



DISCUSSION

The most defining characteristic of a burn injury is the disruption of the skin barrier, which serves as a protective boundary for the body. Such thermal injuries lead to coagulative necrosis, affecting both the skin and its underlying structures. This process not only causes intense pain but also initiates a series of complex local and systemic pathological responses, substantially increasing both morbidity and mortality rates.On the spectrum of burn severity, superficial burns, classified as first-degree burns, typically resolve within 5 to 7 days without leaving scars. However, more severe burns, such as superficial dermal or deep dermal burns—commonly known as second-degree burns—require a longer recovery period ranging from two to four weeks. These burns are not only extremely painful but also pose a higher risk of complications during the healing process.The current study was conducted as a hospital-based cross-sectional analysis within the Department of General Surgery at Rajshree Medical & Research Institute, Bareilly.We are pleased to report that our study encountered minimal complications associated with wound healing or other aspects. The only side effect noted was in one patient who developed a urinary tract infection following topical application of heparin. Beyond this single case, our study observed no significant morbidities. This outcome aligns closely with the findings from a study by Venkatachalapathy et al., which also documented minimal complications and side effects in patients treated with heparin solutions.Patients in the Heparin Group experienced notable benefits such as reduced pain, fewer requirements for water baths and dressings, and the elimination of labor-intensive applications of antibiotic creams. This streamlined treatment made the therapeutic process smoother and more pleasant for both patients and caregivers. Additionally, the atmosphere in the Burn Unit became significantly quieter and more serene.

The application of heparin also had positive effects on the healing process. Burn blisters that were left untreated and did not become infected acted as natural skin grafts, thus eliminating the need for further intervention. The revascularization of ischemic tissues and the enhancement in both the quality and quantity of vascular granulation tissue were particularly remarkable. These improvements are thought to stem from the neoangiogenic effects of heparin, which have been observed in both burn-related and other medical studies. Heparin appears to stimulate capillary endothelial cells to migrate into ischemic tissues, proliferate, and form new capillary networks, thereby restoring blood flow.Clinically, it was observed that there was a reduction in the incidence of surface infections in burns among patients treated with heparin compared to those in the control group. This could be partly attributed to orally administered antibiotics being more effective due to increased blood flow, which helps transport the antibiotics to the injury site more efficiently. This mechanism was consistent with findings from earlier studies, which also noted a decrease in intestinal bacterial translocation and a lower incidence of sepsis.

CONCLUSION / SUMMARY

- There are significant variations in pain scores and analgesic requirements between the groups on different days, indicating differing responses to burn treatments.
- The duration of hospital stays and total fluid requirements show correlations with the severity of burns, which varies significantly between the groups in certain categories.
- The analgesic requirements table reflects a substantial difference in dosage between the two groups, with Group H generally needing fewer doses than Group C.

REFERENCES

1. David N Herndon. Textbook of Total Burn Care 4th Edition. Elsevier Saunders. P1-9.
2. Bhattacharya S. Sushrutha - our proud heritage. Indian J Plastic Surgery 2009;42:223-5
3. Kirkpatrick JJ, Curtis B, Fitzgerald AM, Naylor IL.A modern translation and interpretation of the treatise on burns of Fabricius Hildanus (1560-1634). Br J Plast Surg. 1995 Oct; 48:7: 460-70.
4. Artz CP. History of burns. In: Artz CP, Moncrieff JA, Pruitt BA Jr, eds. Burns: A Team Approach. Philadelphia, PA:WBSaunders;1979;10-16
5. Cope, O., Laugohr, H., Moore, F.D., Webster, R. Expeditious care of fullthickness burn wounds by surgical excision and grafting. Annals of Surgery 125, 1947 : 1-22
6. Yowler CJ, Fratianne RB. Current status of burn resuscitation. Clin Plast Surg. Jan 2000; 27:1:1-10
7. Janzekovic, A. A new concept in the early excision and immediate grafting of burns. Journal of Trauma 1970; 10:1103- 1108.
8. Branski L, Pereira CT, Herndon DN, Jeschke MG. Gene therapy in wound healing: Present Status and Future Directions. Gene Therapy,2006.
9. Boyce ST, Kagan RJ, Yakuboff KP, Meyer NA, Rieman MT, Greenhalgh DG, Warden GD. Cultured skin substitutes reduce donor skin harvesting for closure of excised, full-thickness burns. Ann surg, 2002 Feb; 235(2):269-279. 64