

Incidence and management of burn patients at tertiary care hospital

Altaf Hussain Ghumro, Abdul Hakeem Jamali, Inayat Ali Zardari,
Mashooq Ali Khuwaja, Zulifqar Ali Imtiaz Memon, Imtiaz Ali Soomro

Department of Surgery, Peoples Medical College Hospital, Nawabshah, Sindh, Pakistan

Objective: To detect the incidence and evaluate the management options of burn patients at our tertiary care hospital.

Methodology: Patients with burns admitted in surgical department of Peoples Medical College Hospital (PMHS) were included in the study. History, clinical examination and treatment were reviewed.

Results: Out of 80 patients, 30(37.5%) were male, 40(50%) female and 10(12.5%) children. Fifty(62.5%) patients suffered superficial burns

and 30(37.5%) got deep burns. 76 (95%) patients were treated at PMCH whereas four (5%) were referred to burn unit Civil Hospital, Karachi

Conclusion: The incidence of burn in our study was lower as compared to other studies and the mortality rate was also lowest. Crystalloids were found to be the best fluid along with support of Albumin. (Rawal Med J 202;45:300-302).

Keywords: Crystalloids, colloids, aggressive nutrition, albumin, burns.

INTRODUCTION

Most of the people get burned during their work but a few get it by self harm or violence.¹ There is the change in shape of protein which causes destruction of cells and tissues due to increased temperature. The cell enters into catabolic state by losing balance between sodium and potassium transport. There is increase in catecholamine, cortisol and inflammatory mediators. These all, if not treated timely can lead to impaired wound healing, infection, multi organ dysfunction and death.^{2,3} Mortality rate of burn injuries due to fire in Pakistan is 5.8 per 100,000 persons and burns is the 4th leading cause of injury after RTA.⁴ It was mid of 20th century that excision, skin grafting, fluid resuscitation and its formulas were used for treatment of burns.⁵ Burn injury is divided into 4 degrees according to the area affected and depth of wound involvement.^{6,7}

Some rules are used to calculate the surface area affected. These are Wallace rule of nine, Lund and Browder chart. The treatment starts with aggressive fluid resuscitation Crystalloids in the form of Ringers are used and colloids in the form albumin and FFP are given. Surgical therapy includes debridement, skin grafting and fasciotomies.^{8,9} Burn injury causes complications like infections of wounds, pneumonia, cellulitis, respiratory failure,

compartment syndromes, keloids and acute kidney injury is the most common and fatal complication having 80% mortality.^{10,11} The rationale of our study was to assess the incidence and management in burn patients at our center.

METHODOLOGY

This study was carried out on 80 patients of burn in Surgical Department of PMCH, Nawabshah from March 2013 to March 2018. Less than 5% of TBSA and superficial small burns were excluded from the study. Pulse, BP, temperature and respiratory rate was also recorded. Local examination was done to assess the body surface area affected, depth of burn and also the degree of the burn. Systemic examination was done. Abdominal distension, various signs, exact location of tenderness and signs of peritoneal irritation like guarding, rigidity was also noted. X rays chest was done to know the status of chest organs.

Investigations included complete blood count, urine analysis, blood sugar, blood urea, serum creatinine, serum electrolytes and serum albumin in all patients but Ultrasound of chest, abdomen and pelvis was obtained in patients where required.

RESULTS

There were total 80 patients. Of them, 30 (37.5%)

were male, 40 (50%) females and 10 (12.5%) children below 10 years but above 5 years. Patients were divided into three groups according to the total BSA. Group 1 had 5-20%, Group 2 had 20 to 40% and Group 3 had >40% area burned.

Fire and hot liquids like water and tea were commonest causes of burns (Table 1). In Group 1, patients having superficial and 1st degree burns were kept under observation. In Group 2 included patients, some were treated conservatively and some needed surgical interventions like debridement. Group 3 included burn patients >40% deep burns and needed aggressive debridement, surgical toilet and major interventions. Due to high risk of mortality, these patients were provided ICU monitoring, then later on skin grafting/muscle flaps. Those patients who needed major procedures of plastic surgery were referred to civil hospital Karachi burn ward

Table 1. Types of burns.

Number	Percentage	Type of burn
30	37.50%	Flame Burn
30	37.50%	Scald Burn
10	12.50%	Electric Burn
5	6.25%	Acid Burn
5	6.25%	Frictional Burn
80	100%	

Table 2. Surface area affected and treatment.

Groups	% Tbsa	Number	Depth of burn	Treatment
1	5 to 20%	50	Superficial	Conservative
2	21 to 40%	20	Deep	Surgical
3	< 40%	10	Deep	Surgical
Total		80		

Table 3. Complications.

Complication	Number	Percentage
Infected wound	40	50%
Pneumonia	10	12.5%
Cellulitis	25	31.25%
Abdominal compartment syndrome	2	2.5%
Abdominal distention	5	6.25%
Limbs compartment syndrome	18	22.5%
Generalized edema	5	6.25%

Superficial burns were treated conservatively and those with deep burned needed surgical debridement and later on skin grafting (Table 2). Most common complications were wound infection, cellulitis and limb compartment syndrome (Table 3).

DISCUSSION

Though the majority of burn injuries are minor one but these can be fatal. There are multiple factors determining the outcome of burn injuries. These are time of admission, surface area affected, degree of burn, causative factor, specific organ involvement, age, gender and type of burn.¹²

A study showed that majority (66%) of patients were male¹³ whereas in our study, the higher incidence of 50% was seen in females, who are routinely and commonly busy in their kitchen. In winter season, most of the females and children get injury while making tea. The hospital stay of same study showed 23 days but in our study, it ranged from 10 to 45 days. This was due to surface area affected and depth of injury involved.

A study on self-inflicted burns showed that the most common cause of these burns was fire/flame.¹⁴ Same was found in our study, as 37.5% people got burn injuries due to fire/flame. The average total BSA affected in the same study was 32% and in our study it was 25%. Stiles reported that patients suffering from burn injuries had previous psychiatric disorder.¹⁵ However, in our study, only 2.5% patients had pre burn psychiatric illness.

Abbreviated Burn Severity Index (ABSI) concluded that the mortality rate among females is commoner as compared to males suffering from burn injury.¹⁶ Gender was considered to be the decisive factor for death in females of burn injury. No such association was found in our study. Frictional burn injuries produced by heat of friction between human body and the colliding object is not common and is estimated to occur from 2% to 12%. It causes physical abrasion to skin and heat produced form heat of friction. In our study, its prevalence is 6.25% only.¹⁷

Skin grafting has been recommended immediately after the debridement but in our study, the grafting was done when the wound was ready to be grafted. It

resulted in rare rejection of the graft. In a study, *Candida albicans* was the most common fungus to infect burn wounds¹⁸ but in our study, the culture report mostly showed *Staphylococcus Aureus* and *Pseudomonas* in infected burn wounds.

CONCLUSION

The incidence of burn in our study was lower as compared to other studies and the mortality rate was low also. Crystalloids were found to be the best fluid along with support of Albumin. Flame and scald burn incident were common in our study. Wound infection and cellulitis were commonest complications.

Author Contributions:

Conception and design: Altaf Hussain Ghumro, Abdul Hakeem Jamali

Collection and assembly of data: Inayat Ali Zardari

Analysis and interpretation of the data: Altaf Hussain Ghumro, Abdul Hakeem Jamali

Drafting of the article: Altaf Hussain Ghumro, Inayat Ali Zardari

Critical revision of the article for important intellectual content: Altaf Hussain Ghumro

Statistical expertise: Abdul Hakeem Jamali

Final approval and guarantor of the article: Altaf Hussain Ghumro

Corresponding author email: Altaf Hussain Ghumro:

Conflict of Interest: None declared

Rec. Date: Sep 6, 2018 Revision Rec. Date: Dec 15, 2019 Accept

Date: Feb 16, 2020

REFERENCES

1. Audra Clark, Imran J, Madni T, Wolf SE. Nutrition and metabolism in burn patients; *J Burns Trauma* 2017;5:11
2. Porter C, Tompkins RG, Finnerty CC, Sidossis LS, Suman OE, Hemdon DN. The metabolic stress response to burn trauma; current understanding and therapies. *Lancet* 2016;388(10052).1417-26.
3. Dries DJ, Marini JJ. Management of Critical Burn Injuries: Recent Developments. *Korean J Crit Care Med* 2017;32:9-21.
4. Kaddora I. Burn injury: review of pathophysiology and therapeutic modalities in major burns. *Ann Burns Fire Disasters* 2017;30:95-102.
5. Murphy F, Amblum J. Treatment of burn blisters: debride or leave intact? *Emerg Nurse* 2014;22:24-7.
6. Atiyeh BS, Costagliola M, Hayek S. Burn prevention mechanisms and outcomes: pitfalls, failures and successes. *Burns* 2009;2:181-93.
7. Mann R, Heimbach D. Prognosis and treatment of burns. *West J Med* 1996;165:215-20.
8. Burd A. Research in burns – present and future. *Indian J Plast Surg* 2010;43:S11-4.
9. American Burn Association. National Burn Repository 2014.2014.
10. Rowan MP, Cancio LC, Elster EA, Burmeister DM, Rose LF, Natesan S, et al. Burn wound healing and treatment: review and advancements. *Crit Care* 2015;19:243.
11. Choi JY, Kim SH, Oh GJ, Roh SG, Lee NH, Yang KM. Management of defects on lower extremities with the use of matridem and skin graft. *Ann Plast Surg* 2014;41:337-43.
12. Anthonissen M, Daly D, Janssens T, Van den Kerckhove E. The effects of conservative treatments on burn scars: a systematic review. *Burns* 2016;42:508-18.
13. Bitter CC, Erickson TB. Management of burn injuries in the wilderness: lessons from low-resource settings. *Wilderness Environ Med* 2016;27:519-25.
14. Devinck F, Deveaux C, Bennis Y, Deken-Delannoy V, Jeanne M, Martinot-Duguennoy V, et al. Deep alkali burns: Evaluation of a two-step surgical strategy. *Ann Chir Plast Esthet* 2018;63:191-6.
15. Stiles K. Emergency management of burns: part 2. *Emerg Nurse* 2018;26:36-41.
16. Eyvaz K, Kement M, Balin S, Acar H, Kündes F, Karaoz A, et al. Clinical evaluation of negative-pressure wound therapy in the management of electrical burns. *Ulus Travma Acil Cerrahi Derg* 2018;24:456-61.
17. Wu YT, Chen KH, Ban SL, Tung KY, Chen LR. Evaluation of leap motion control for hand rehabilitation in burn patients: An experience in the dust explosion disaster in Formosa Fun Coast. *Burns* 2019;45:157-64.
18. Johnson SP, Chung KC. Outcomes Assessment After Hand Burns. *Hand Clin* 2017;33:389-97.