

Original Research

A Retrospective Observational Study Of Paediatric Burn Cases Describing Time Of Injury, First Aid Provided And Time Taken To Present In The Specialized Burn Unit-An Original Research

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ABSTRACT

Aim: The purpose of the present research was to assess the pediatric burn cases describing time of injury, first aid provided and time taken to present in the specialized burn unit.

Methodology: A Retrospective study was conducted in Osmania general Hospital, Hyderabad, Andhra Pradesh, India, over a period of 24 months from January 2011 to January 2013. Paediatric burns comprise 12.99% of the total burns. All male, female in-patients belonging to paediatric age group (0-15 years), admitted in Burns Unit of our Hospital were included in the study. Maintenance fluids were given at hourly rate of 4ml/kg for first 10kg body weight+ 2ml/kg for second 10kg body weight+ 1ml/kg for >20kg body wt. Collagen was applied to all children with superficial burns and partial thickness burns that come before 24- 48hr from the time of incident.

Results: 2-5 years children were commonly affected followed by age group between 11-15, next in order by 6-10 years. Meal times (especially lunch, 11a.m.-2 p.m. and dinner 6p.m -9 p.m.) clearly had the highest number of burn accidents. Most of the children with burns were reported to the hospital within 24 hours because of increased public awareness (370 children -81.2%). Most of the children received first-aid in the form of Water (328 children-72%).

Conclusion: Most important step in prevention is public education and availability of good burn care facilities in all public institutions as near to the place of accident as possible.

Keywords: burns; pediatrics; multidisciplinary care; prevention; children

INTRODUCTION

Burn injuries are the third common type of injury causing death in children, following motor vehicle crash and drowning accidents. Children constitute 34% of Indian population most of

the paediatric burns are simple domestic accidents, very rarely intentional and most of them are preventable. A minority of burn injuries are serious and meet criteria for transfer to a burn center; the care of these critically ill children requires a coordinated effort and expertise in the management of the burned patient. The mortality rate following major burns at these highly specialized centers is less than 3%.¹ This provides a team of pediatricians, surgeons, anesthesiologists, intensivists, nurses, respiratory therapists, and other healthcare providers with a unique opportunity to make a multidisciplinary collaborative effort to help some of the most vulnerable patients. The cause of burn injury varies depending on the age of the child and based on historical clues. Scald injuries tend to be the most common type of thermal injury under the age of 5, accounting for over 65% of the cases, while fire injury tends to occur in older children, accounting for over 56% of the cases.² The identification of injury mechanism may provide clues into the other systemic manifestations, for example, the significant component of coexisting inhalational injury after a fire. Finally, child abuse has to be on the differential for any suspicious lesion. A typical injury of this type involves a pattern consistent with a scald injury in a typical “stocking” distribution, although a high index of suspicion needs to be maintained in all mechanisms of burn injury. In children under the age of 2, nearly 20% of cases of burn injury may be reported to state social services for investigation, and a fifth of these reported patients were discharged to foster care.¹ The goals of initial patient management include preservation of overall homeostasis while appreciating the physiologic challenges that the burn injury poses to the body. Major burn injury not only results in local damage from the inciting injury, but in many cases results in multisystem injury. Initial efforts are focused on resuscitation, maintaining hemodynamic stability, and airway management. Intermediate efforts are focused on managing the multi-organ failure that results from systemic inflammatory mediators that result in diffuse capillary leak and surgical therapy. Finally, efforts shift to issues with chronic wound healing, pain management, restoration of functional capabilities, and rehabilitation. The traditional classification of burns (first, second, third degree) has been replaced by a classification system that reflects the need for surgical therapy—burns are currently grouped as superficial, superficial partial-thickness, deep partial-thickness, full thickness, and fourth-degree burns.⁴ A superficial burn is classified as a burn that affects the epidermis, without involvement of the dermis, usually presenting with redness with erythema. A partial thickness burn (both superficial and deep) involves the entire epidermis and variable parts of the dermis. A superficial partial-thickness burn presents with pain, redness that blanches, and blistering. In contrast, a deep partial-thickness burn presents with only pressure, a variable color (white to red) that does not blanch, and blistering—these generally require surgical therapy. Full thickness burns affect the entire epidermis and dermis, usually presenting with a particularly leathery appearance. Lastly, fourth-degree burns are the deepest subgroup with involvement of fascia, muscle, and bones. While deep partial-thickness burns are usually treated with surgical procedures, full thickness and fourth degree burns are almost always treated with surgical excision and grafting. Children have remarkable cardiopulmonary reserve, and clinical signs of hypovolaemia like low-blood pressure and decreased urine output may not present until more than 25% of circulating volume is lost and complete cardiovascular decompensation is imminent. Adequacy of fluid resuscitation can be assessed by monitoring sensorium, and peripheral circulation, pulse pressure, digital extremity colour, capillary refill, body temperature and arterial blood gas analysis.

AIM OF THE PRESENT STUDY

The purpose of the present research was to assess the pediatric burn cases describing time of injury, first aid provided and time taken to present in the specialized burn unit.

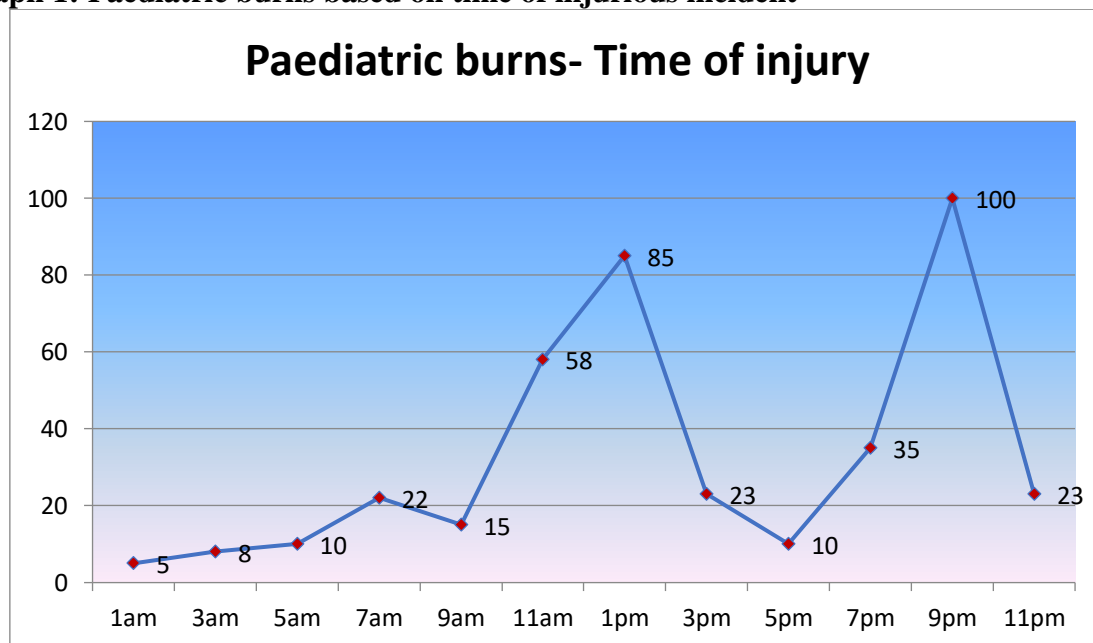
METHODOLOGY

A Retrospective study was conducted in Osmania general Hospital, Hyderabad, Andhra Pradesh, India, over a period of 24 months from January 2011 to January 2013. Paediatric burns comprise 12.99% of the total burns. Of total paediatric admissions (5234), burns constitute 456 accounting to 8.71%. All male, female in-Patients belonging to paediatric age group (0-15years), admitted in Burns Unit of our Hospital were included in the study. Paediatric burn patients treated on out-patient basis were excluded from the study. The data was recorded and analyzed using the Chi square test (SPSS-10 software). A P value of less than 0.05 was considered statistically significant. Resuscitation started with the infusion of isolate P, half of the calculated fluid was given in the first 8 hours, remaining half in next 16hrs from the time of burn injury. Maintenance fluids were given at hourly rate of 4ml/kg for first 10kg body weight+ 2ml/kg for second 10kg body weight+ 1ml/kg for >20kg body wt. Hourly urine output charts and 4th hourly temperature, pulse charts was maintained. The patients and their parents were repeatedly advised regarding the importance of adequate oral liquids as soon as possible, hand physiotherapy and elevation, early ambulation in preventing pulmonary morbidities. Collagen was applied to all children with superficial burns and partial thickness burns that come before 24- 48hr from the time of incident.

RESULTS

In our study, male children (274 children -60.08%) outnumbered female children (182 children- 39.91%). The overall male to female ratio was 1.5: 1. 2-5 years children were commonly affected followed by age group between 11-15, next in order by 6-10 years. Infants were affected the least. Meal times (especially lunch, 11a.m.-2 p.m. and dinner 6p.m -9 p.m.) clearly had the highest number of burn accidents. 35% per cent of all paediatric burns occurred at dinner time and 19.7% at lunch time. (Graph 1)

Graph 1: Paediatric burns based on time of injurious incident



Most of the children received first-aid in the form of Water (328 children-72%), while others were subjected to Ointment (79 children -17.5%), ice (17 children- 3.8%) or other measures (13 children- 3%). No First-aid was given in 16 children (3.7%). (Table 1)

Table 1: Various first aid measurements encountered in present study

First-aid measures	No. of Patients	Percentage
Water	328	72 %
Ointment	79	17.5 %
Ice	17	3.8 %
None	16	3.7 %
Others	13	3 %

Most of the children with burns were reported to the hospital within 24 hours because of increased public awareness (370 children -81.2%). 57 children (12.5%) reported to hospital within first 48 hours. morbidity and mortality increased in paediatric burn victims reporting after 48 hours. (Table 2)

Table 2- Time of treatment since the burn incident amongst the patients

Time delay	No. of patients	Expired	Survived
< 24 hours	370(81.14%)	59(15.94%)	311(84.06%)
24 -48 hours	56(12.28%)	10(17.85%)	46(82.15%)
> 48 hours	30(6.57%)	7(23.33%)	23(76.67%)

DISCUSSION

Analysis of age records in our study showed that maximum patients were between 2-5 years of age accounting for 35.18% followed by older children of 11-15 years (32.53%) and this data is consistent with most other reports.⁵ 2-5 years age is the period where the children begin independent mobility, manifest exploratory and hand to mouth behaviour. There is an overall male preponderance with male children accounting for 60.08% (male: female ratio of 1.5:1). This is similar to what has been reported by other studies done by Morrow, Mercier.⁶ This was in contrast to the high female: male ratio of 3:1 in the report by Pramod Kumar et al.⁷ In the present study, two meal time periods (11 a.m.-1 p.m. and 5-8 p.m.) were identified as high-risk times for paediatric burns (respectively 35.0% and 19.7% at dinner and lunch time). The two peak incidences in the time of injury were similar to Chien et al's report but in our study (which focuses on paediatric burns) dinner time was more dangerous than lunch time.⁸ Most of the children received first-aid in the form of Water (72%), while others were subjected to Ointment (17.5%), ice (3.8%) or other measures (3%). In this study, we found a significant relationship between burn depth and recommended first-aid application, specifically that more superficial burns were associated with first-aid use compared with deeper burns. Others have also found this relationship— Nguyen et al.⁹ reported that burns treated with first aid (immediate application of cold water) were less deep and required less skin grafting ($P = .007$). They suggested that the first-aid treatment directly led to a decrease in burn depth.

CONCLUSION

The most important step in prevention is public education and availability of good burn care facilities in all public institutions as near to the place of accident as possible. We hope further medical assistance, burn prevention movement, dissemination, and public education should be set-up and conducted properly to prevent paediatric burns.

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