

Research Article

Epidemiology of Burns in Pediatric Patients at a Tertiary Care Centre of Southern Punjab

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Abstract |

Background: Burns are a common cause of childhood injury throughout the world. The objective of this article is to describe epidemiological pattern, etiology, clinical presentation, and outcome in pediatric burn patients.

Methodology: This descriptive case series was done at plastic surgery and burn department of Sheikh Zayed Hospital Rahim Yaar Khan from Jan 2020 to Dec 2020. It was a retrospective data analysis of the records of all patients up to 15 years old with burn injuries that were managed at our center. Patient data was collected via a special proforma and analyzed with Statistical Package for Social Sciences (SPSS) version 23.

Results: Total 160 children were admitted from January 2020 to December 2020.. Male patients were 84 and females were 76. Two third of the children were below 5 years of age; 53.8% had burn with hot liquids; 98.8% were accidental and 87.5% children had burn at home in kitchen environment. Average TBSA was 17%±11; 60.6% were from rural areas, and 68.8% belonged to low socioeconomic status. 89.4% patients were managed conservatively; 30.6% were cured, 30% healed with complications and 4.4% patients expired.

Conclusion: Accidental burns in household environment are the most common cause of burn in children specially those under 5 years of age.

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Introduction

Burns are a major public health problem associated with high risk of mortality and morbidity. Burns are a common cause of childhood injuries throughout the world.¹ According to World Health Organization's report, 95% of burn related deaths occurred in low and middle income countries.¹ Pediatric burns are more common in low income countries as compared to countries with high income.¹² Burn is the second most common cause of accidental death in children less than 5 years and the most common cause of accidental death in the home.^{3,4} Nearly 75% of all burns in children are preventable. Burn incidence is highest in children below 5 years of

age due to their impulsiveness, lack of knowledge, higher level of activity, and dependency on care providers.^{5,6}

Burn management in developing countries is a major challenge due to many reasons such as absence of a burn registry, insufficient burn care centers and lack of education and resources^{7,8}. In Pakistan there is not even a single dedicated pediatric burn center.

The rationale of this study is to generate local data that can be used to effectively devise burn prevention and management strategies aimed at the vulnerable pediatric population.

Methodology

This descriptive study was conducted at the Plastic Surgery and Burn Department of Sheikh Zayed Medical College / Hospital, Rahim Yar Khan from January 2020 to December 2020. The ethical approval for the study was taken from the hospital ethical committee. The records of all pediatric patients' up to 15 years of age with burn injuries who were managed at our burn unit were retrieved from hospital patient record and included in the study.

Patients' data were collected through a proforma from previously recorded history and clinical examination. Patients' demographic data, etiology, place of burn injury, burn type, body area involvement, percentage of burn and parents' knowledge about burn prevention and first aid were recorded. Outcome in terms of cured completely, survived with complications and mortality were also recorded. Children over the age of 15 years and those who were previously admitted and treated for burn injuries at some other hospitals were excluded from the study. Patients with minor superficial burns (< 10% TBSA) treated as out patients and those with incomplete record were also excluded.

All patients received standard ER management according to ATLS protocol followed by specific management for burns such as fluid resuscitation, pain management and the need for emergency escharotomy. The patients also received standard care in the ward as dictated by the requirements of their burn wounds. During the follow-up period of minimum six months, patients were assessed for wound healing in terms of healed completely, or healed with complications (Hypertrophic scars, keloids, and contractures). The data were analyzed via Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistical tests were applied.

Results

Total 160 pediatric patients were treated in the burn unit during the study period from January 2020 to December 2020. This was amongst a total number of 620 patients admitted to the burn unit during this period, accounting for an incidence of 25.8 % for pediatric burns. The mean age was 61 ± 45 months (Range 5 months to 15 years). Two third of the children, (n=99, 61.9%) were below 5 years of age. 84 (52.5%) were male and 76 (47.5%) were females. Majority of patients hailed from rural areas and were from families that belonged to low socioeconomic status. 51% of the fathers were laborers by professions, 82.5% of the mothers were house wives. A high proportion of the parents were illiterate. Table 1

shows the demographic details of the study population. 98.8% of pediatric burns were found to be accidental in nature. There was only 1 reported homicidal and 1 suicidal case of pediatric burn. 87.5% children had burns at home in the kitchen environment. Regarding mode of injury, scald burns were most common (n=86, 53.8%), followed by flame burns (n=69, 43.1%). Table 2 shows the mode of injury and gender distribution in different age groups.

The average Total body surface area (TBSA) burnt was 17%. Majority of the patients had less than 20% TBSA involved. Figure 1 shows the distribution of patients according to percentage of TBSA burnt. Majority of the children (67%) had mixed pattern (superficial partial thickness and deep dermal) burns. Commonly involved different body parts included anterior trunk (55%), upper limb (46.5%), head & neck (33.8%) posterior trunk (29.4%), lower limb 43%, Buttock (21.3%) and genitalia (12.5%). Associated inhalational injury was seen in 12 (7.5%).

Comorbid conditions (epilepsy) were present in 3 (1%) of the patients, and only one patient had hepatitis C positive status. Average time lapsed since burn and arrival to hospital was 8 ± 3 hours. Most of the patients (89.4%) were managed conservatively by closed method and 17(10.6%) patients had skin grafting for their wound coverage.

Regarding treatment outcome (Fig. 2), 8 (5%) patients left against medical advice, and 48 (30%) were discharged on request, 49 (30.6%) were cured, 48 (30%) healed with complications and 7(4.4%) patients, having 30%

Table 1: Demographic Details of study sample

Variable	Value
Mean Age	61 months
Age bracket	
<5 years	99 (61.9%)
5-10 years	38 (23.8%)
11-15 years	23 (14.3%)
Gender	
Male	84 (52.5%)
Female	76 (47.5%)
Origin	
Rural	97 (60.6%)
Urban	53 (39.4%)
Socioeconomic Status	
Low	110 (68.8%)
Medium	36 (22.5%)
High	14 (8.75%)
Illiteracy Rate	
Mother	62.5%
Father	38%

or more burnt area, expired. Expiry was more in patients with inhalation injury, (16.7%) vs those without inhala-

tional injury (3.4%). Regarding nature of complications; 23 (14.4%) patients developed Hypertrophic scars, 5(3.1%)keloids and 20 (12.5%) developed contractures. Most of the parents (61.3%) had none or poor knowledge about first aid and preventive measures against burns at home. There were 4±1.6 children in a family and 61% of families the home consisted of only one living room. Number of admissions during winter was 43.8% more than the summer season: 115 vs 45 (71.9% vs 28.1%).

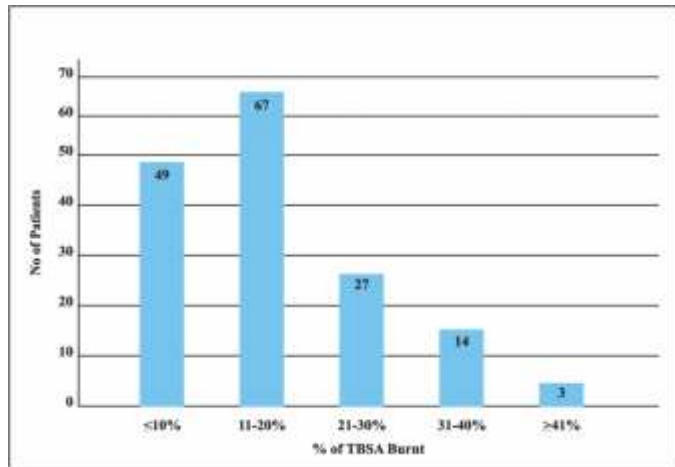


Figure-1: Distribution of patients according to percentage of TBSA burnt (n=160)

TBSA, Total Body Surface Area

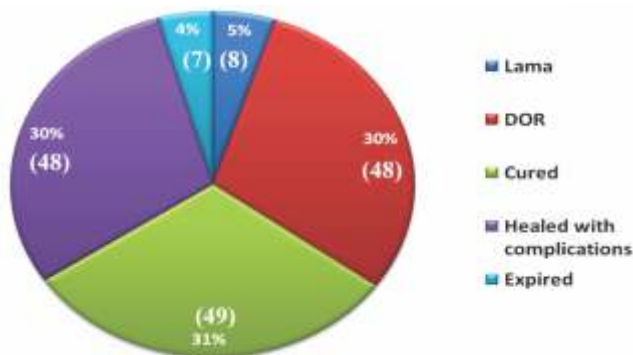


Figure- 2: Treatment outcome of the burns patients (n=160)

Discussion

Burn is an important cause of preventable injury, especially in the pediatric age group. Although burn injury

is known to have a poor prognosis, with recent advances in fluid resuscitation, critical care and early surgical intervention, survival of even severely burnt patients has become an expectation.^{9,10,11}

This study was carried out on 160 pediatric burn patients with an objective to analyze different factors which influence the management and outcome of burns in different age groups. Based on this study’s findings, we can suggest measures that can be taken to prevent burns in children and these preventive measures can be implemented through public education.

Our study showed that about two-third of children were below 5 years and both genders were equally affected. Both of these findings are consistent to other studies on pediatric burns.^{2,12,13}

Overall Scald burn (53.8%) was the most common mode of injury in children and 80.3% were less than 5 years of age, all happening accidentally in home environment. In older children flame burn (58%) was relatively more common cause of burn injury. This finding was also similar to other studies.^{5,6,9,13} However the incidence of electrical and chemical burns was much less as compared to other studies.^{2,12,14}

Most of the burns (67%) were of mixed pattern, superficial partial thickness and deep dermal. This finding is also similar to other studies.^{2,5,6,11,15} In our study the burn admissions increased by 43.8% in winter season. The reason for this is increased use of gas cylinders, heaters, and open fires. The practice of boiling of water in large open pots and then transferring it to other places for showering and cleaning utensils also contributes to increased scald burns in young children.^{2,8,16}

Majority of our patients (60.6%) were from rural areas and most of them (68.8%) belonged to low socioeconomic status. Most of the parents were also illiterate. These factors account for lack of awareness toward safety measures and lack of educational and preventive programs in our population.

The mortality rate among our population was 4.4%.

Table 2: Mode of injury and Gender distribution in different age groups (n=160)

Mode of Injury	0-5 Years		6-10 Years		11-15 Years		Total	Percentage
	Male	Female	Male	Female	Male	Female		
Scald Burn	37	32	09	04	01	03	86	53.75 %
Flame Burn	19	10	06	17	08	09	69	43.125 %
Electric Burn	0	01	02	0	01	0	04	2.5 %
Acid Burn	0	0	0	0	01	0	01	0.625 %
Total	56	43	17	21	11	12	160	100 %

The rate was significantly low in our patients as compared to other studies.^{2,9,10,12,17} Our burn and reconstructive surgery unit is very primitive and consists of 26 beds and lacks burn ICU and other modern burn care facilities. A significant number (30%) of moderate to major burn patients were discharged on request as the parents were willing to take their patients to some better burn care centers in other cities. This could be the reason of the apparently low mortality rate in our studied population. Majority of our patients (89.4%) were managed conservatively; and only 10.6% patients had skin grafting for their wound coverage. Mean hospital stay was 7.1 ± 6.8 days. It was less as compared to other studies because significant number (30%) of patients were discharged on request and 5% left against medical advice.^{5,9,12,18,19}

Our studied population had poor knowledge about first aid for a burned patient and only in 13% patients cold water was used to cool the burned area. In other patients unspecified medicinal creams, blue dye (neel), butter, toothpaste and homemade remedies were applied or nothing was used. Other studies also confirm use of such remedies.^{8,20} Most of the parents did not use water to cool the burned area due to fear of blister formation after use of water. There is a tremendous need to improve knowledge of burn first aid in our general population.

Conclusion

Children less than 5 years are most vulnerable to accidental burn injuries, usually sustained in the kitchen. These findings should guide the development and implementation of burn prevention policies. Through a combination of preventive measures and improved burn care, not only the death rates can be lowered but also the goal of physical, social and psycho-logical rehabilitation can be achieved in pediatric burn patients.

Conflict of Interest

None

Funding Source

None

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