

ORIGINAL RESEARCH

A Retrospective Observational Study Of Paediatric Burn Cases Elaborating Types Of Burns, Percent Of Tbsa Involved & Its Relation To Parental Literacy And Employment Status-An Original Research

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ABSTRACT

Aim: The purpose of the present study was to assess paediatric burn cases based on variables like- Total body surface area (TSBA) involved, parents literacy rates as well their employment status.

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 (0-15years), 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: Burns occurred commonly in children with illiterate (76.48%) and unemployed (69.21%) parents. Dinner time (35%) and colder months of the year were more prone timings. Most of the burns were accidental (98.56%). Flame burns predominated (47.79%) scalds (37.5%). Most of the children sustained burns of 11-30% TBSA (40.56%).

Conclusion: It was evident that literacy as well as being employed helped prevent burn incidents in pediatric cases.

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

INTRODUCTION

Burn-related injuries are a leading cause of morbidity and mortality in children. Burn injuries rank third among injury-related deaths in children aged 1 to 9 years.¹ In India, paediatric burns account for 17–25% of total burn admissions.^{2,3} Approximately 90% of burns are caused by

household accidents. In children younger than three years, scalds are responsible for most of the burns.⁴ Scald burns usually occur when a child accidentally pulls the container with hot liquid onto himself. It may also result from bathtub submersion injuries usually by an unattended child. In older children, flame burns are more common. Firecracker injuries and household fires are the common aetiologic factors for these burns, which are often of full thickness. Management of the children with major burns taxes skills of the personnel of any unit. Appreciating the major differences between burn management in children and adults is important. Children have nearly three times the body surface area (BSA) to body mass ratio of adults. Fluid losses are proportionately higher in children than in adults. Consequently, children have relatively greater fluid resuscitation requirements and more evaporative water loss than adults. The large BSA to body mass ratio of the child also predisposes the child to hypothermia, which must be aggressively avoided. Children younger than two years have thinner layers of skin and insulating subcutaneous tissue than older children and adults. As a result, they lose more heat and water than adults do, and they lose these more rapidly than adults. In very young children, temperature regulation is partially based on non-shivering thermogenesis, which further increases metabolic rate, oxygen consumption, and lactate production. In addition, because of disproportionately thin skin, a burn that may initially appear to be of partial thickness in a child may instead be of full thickness in depth. WHO estimates that in India over 10 lakh people are moderately or severely burnt annually. In India alone, around 7 million people suffer from burn injuries, out of which, 7 lakh need hospital admission and 2.4 lakh become disabled. Rapid assessment and treatment of immediate life-threatening conditions is mandatory in patients with burns. Endotracheal intubation is indicated in children with respiratory distress or airway compromise caused by airway oedema. Because of the small diameter of the paediatric airway, a low threshold for intubation should be maintained. Children with burns affecting more than 10% of the BSA should receive intravenous fluid resuscitation. With the exception of infants, the prognosis for survival in children and adolescents is quite good. The most important factor that has led to improvement in prognosis is the prompt identification, excision, and effective wound closure.⁵ Besides, strides have been made in resuscitation, intensive care, antimicrobials, vascular access, nutritional support, and skin banking. However, presence of co-existent inhalational injury places the child at higher risk of mortality.⁶ Thus, at the present time most children with large burns in absence of inhalational injury should survive their injuries.

AIM OF THE PRESENT STUDY

The purpose of the present study was to assess paediatric burn cases based on variables like- Total body surface area (TSBA) involved, parent's literacy rates as well their employment status.

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 (0-15 years), 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 isotonic 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

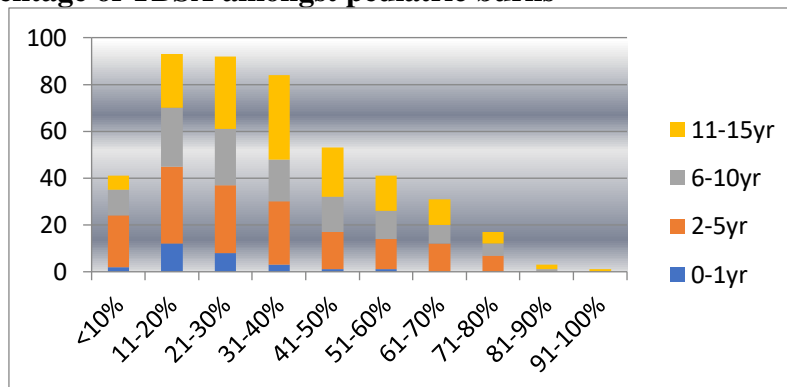
Flame was the predominant cause of burns on the whole (217 children-47.58%). Scalds were the most common type of burns under the age of 5 years (171 children -37.5%). Flame burns predominated in older children. Electrical burns (61 children-13.37%) were common in older (11-5years) age group. Chemical burns (2 children-0.43%) and blast injuries (5 children-1.09%) are rare. (Table 1)

Table 1: Various types of etiological agents associated with burn injuries

Burn Type	No. of Patients	Percentage
Scalds	Non-bath (141-82.35%)	171 37.5%
	Bath (30-17.64%)	
Flame	218	47.79%
Electrical	61	13.37 %
Fireworks	4	0.877%
Chemical	2	0.43 %
Total	456	100%

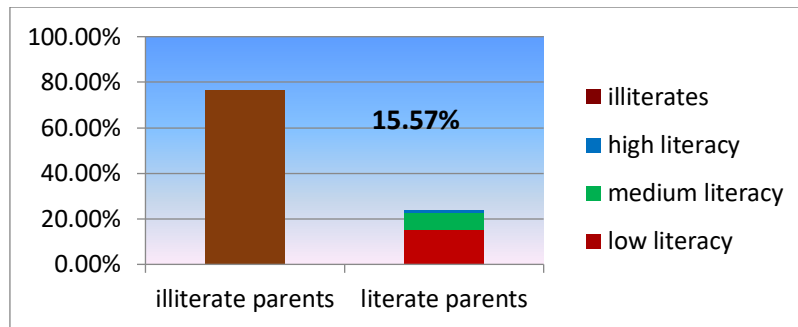
The pattern of distribution of patients varied according to the total burn surface area. Large burns were defined as $\geq 30\%$ (estimated by Lund & Browder's chart). Large total burn surface area was the strongest predictor of mortality. The mean burn size was significantly larger in non-survivors. It is evident that a large number of children (47.85%) are victims of 10-25% TBSA. (Graph 1)

Graph 1: Percentage of TBSA amongst pediatric burns



Burn injuries were more common in children with illiterate parents (348-76.48%) followed by literate parents (71-15.57%). parents are further classified into three categories based on their educational qualifications into Low (E.g.: up to 10th class), Medium (E.g.: up to Intermediate) and High (E.g.: up to Graduation). (Graph 2)

Graph 2: Association of pediatric burns with literacy rate of parents



Distribution of Burn injury is high in children with unemployed parents (316 children -69.2%), followed next in order by employed parents (140 children -30.80%). The majority of fathers were manual labourers (59%), followed by clerical jobs, factory workers, and vendors. Ninety five percent of mothers were housewives. Children with both employed parents got higher incidence compared to single employed parent. (Table 2)

Table 2: Pediatric burns associated with employment status of parents

Employment status	No. of patients	Percentage
Unemployed parents	316	69.2%
Employed parents	140	30.8%

DISCUSSION

Majority of burns took place at home and accidental burns were the commonest (98.46%), which are preventable. In the present study the majority of the burns occurred in a domestic setting, as reported by others.⁷ The reasons postulated are Children often play in the house and are frequently in and out of the kitchen, Parents can be negligent in the care of their children because of their large number in one family, Matches and lighters are frequently used for lighting ovens, candles, heaters, and gas lamps and are not placed out of reach of children., Children try to mimic the actions of adults. Relative limitation of daily activity might be the cause. These factors are further substantiated by the lack of supervision, lack of awareness about injurious agents, and carelessness on the part of parents. Homicidal and suicidal burns are very rare. Stress of rat race for academic rank, influence of media and cinema is also contributing towards increasing the suicidal burn incidence among children. 76.48% of the burn injuries occurred in children with illiterate parents. Burn injury is high in children with unemployed parents (69.2%), followed next in order by children where both parents are employed, and where the children were taken care by grandparents, elder siblings, or caretakers. Flame burn(47.58%) is predominant over scald burn in our study. This might be related to the low socioeconomic status and worsening of the power crisis turning most families to the use of kerosene lanterns and stoves. According to Cronin and Von Niekerk⁸ scalds were the most common injury in developed countries in contrast to our study. This may be related to cultural differences related to alternative power sources for lighting and cooking in developed world. Scalds were the most common type of burns under the age of 4 years (37.5%). Prevalence of scalds can be attributable to the fact that the children are often left unattended at home and they are too small to understand the dangers of being in the vicinity of injurious agents. Electrical kite burns (13.37%) are third common cause with prevalence during months of December, January, February. Large number of children (47.85%) are victims of 10-25% TBSA, with an average of 16.35% followed in order by 0-10% TBSA. This is in accordance with the work of Morrow⁹ and discordance with reports of some reports from Chien.¹⁰ These are usually associated with good prognosis in this age group in the absence of significant comorbidities and inhalational injury.

CONCLUSION

Burns occurred commonly in children with illiterate (76.48%) and unemployed (69.21%) parents. Most of the burns were accidental (98.56%). Flame burns predominated (47.79%) scalds (37.5%). Most of the children sustained burns of 11-30% TBSA (40.56%).

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