

ORIGINAL RESEARCH

A RETEROSPECTIVE STUDY OF THE RISK FACTORS FOR PAEDIATRIC BURNS

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ABSTRACT

Background: Burn injury is an important cause of mortality and disability in children in developing countries like India, but our knowledge of risk factors for these is limited.

Aim: The aim of this retrospective study was to find out the risk factors of pediatric burns, particular to our society.

Material and methods: A retrospective study of 112 cases of burn patients was performed from July 2008 to June 2011. Out of these only 62 patients were in age of 0-16 yrs. We analyzed the data extracted from patient records on age, sex, place of burn, family size, economic status, cause and mode of burn.

Result: The most common risk factor for pediatric patients was accessibility of hot liquid/combustibles, use of unsafe kerosene stoves/lamps, overcrowding and absence of parents/guardians at the time of burn.

Conclusion: Burn injury could be prevented by improving the home environment, socioeconomic living condition through the health, social welfare, housing department and education of adult as well as children about preventable aspect of burn.

Key words: Pediatric burn, Epidemiology, Risk factors

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INTRODUCTION

Children are more prone to various types of trauma out of which burn injuries are common and require an experienced, multidisciplinary team for its management. Approximately 95% of burns occur in the low & middle income countries.¹ Rates of fire-related deaths in low and middle income countries are 5.5 deaths/1,00,000 people per year.^{1,2} This is nearly six times higher than the fire-related deaths occurring in high income countries. Further, most of the burn victims in developing countries belong to low socio-economic profile which makes them more vulnerable for the overwhelming economic consequences.

Exposure to various types of injuries in pediatric group is quiet high, which can be justified by their inability to recognize and evaluate dangerous situations. Burn is the third most common cause of trauma related mortality in children aged 1-9 yrs.^{2,3} In India, pediatric burns account for 17-25% of total burn admissions.³⁻⁵

The most common cause of pediatric burns, especially in children < 3 yrs are scalds where as in older children flame burn is more common.^{3,6}

Being a serious global health problem, burn injury not only leaves scars, disability and disfigurement of child, but more importantly results in scaring of the child's personality due to social stigma and rejection. The epidemiology of burn is diverse across the world because of difference in the cultural and socio-economic factors. Even within the developing countries like India, various local and regional socio-cultural factors are responsible for the problems related to the burn injury. To date very few data has been published regarding risk factors in pediatric burns in India. The aim of this retrospective study was to find out the risk factors of pediatric burns;

particular to our social setup. This study will help us to plan the preventive strategies for pediatric burns.

MATERIAL AND METHODS

This is a retrospective study of patients with burn injury admitted from July 2008- June 2011 at the Emergency Department of TeerthankerMahaveer Medical College, India. Children less than 16 years of age admitted in hospital with electrical, chemical and thermal burn were included in the study.

Out of the total 112 burn patients, only 62 patients were under the age of 16 years. Medical records of all these pediatric burns patients were studied. The children were categorized into the following 5 age groups: birth to 3 years, 3-6 years, 6-9 years, 9-12 years and 12- 16 years. Profile of the patients, cause of burn and various risk factors like accessibility to combustible and hot liquids, unsafe kerosene stove/lamps, unsafe electrical wiring, fireworks, flammable/ loose fitting clothes, absence of parents at the time of burns, overcrowding, housing in slums/ remote area were recorded and analyzed.

STATISTICAL ANALYSIS

These data were recorded in a data sheet and subsequently analysed using SPSS software (v:17). Missing information was abstracted from individual medical records of patients.

RESULTS

Out of 112 burn patient cases recorded from July 2008- June 2011, only 62 patients were in the age group of 0-16 years (55.6%). Detailed records of 5 patients were not available and thus were excluded from the study. Out of 57 patients studied, 26 (45.6%) were boys and 31 (54.3%) girls (Table 1). In all age groups, there were more female than male victims. The maximum number of burns (35.08%) occurred in 3-6 year age group.

The most common cause of Pediatric burns in our study was scalds (45.6%) followed by flame (33.33%) and electrical/chemical burn (21%). 50% of patients with scalds were seen in the age

group of 3-9 yrs. Pediatric burns due to flames were more common in the age group of 6-9 yrs (26.3%). Electrical and Chemical burns were common in the age group of 6-12 yrs (Table 2).

The most common risk factors for pediatric burns in our study were accessibility of hot liquids/combustibles, use of unsafe kerosene stoves/lamps, overcrowding and absence of parents/guardians at the time of burns (Table 3).

Age (years)	Males	Females	Total
0-3	7	8	15
3-6	7	13	20
6-9	7	3	10
9-12	3	3	6
12-16	2	4	6

Table-1: Age and Sex wise distribution

DISCUSSION

Burn injuries are a major cause of morbidity and mortality in children. This form of trauma is one of the commonest causes of hospitalization and is an important preventable cause of trauma among children. In India, pediatric burns account for 17-25% of the total burn admissions.³ Etiology of burn injuries varies as child progresses through the stages of normal development. Scald burn is predominant in most series and constitute seventy percent of all thermal burns in infants, toddlers and preschool children. Scalds mostly occur at home.

The overall incidence of pediatric burn (<16 years age group) in our study was 55.3% of total

admitted patients, which is quite high as compared to other studies.^{7,8} Probably the high incidence of pediatric burns in our study was because of the fact that the hospital where the study was done, caters mainly to rural population having low socioeconomic status and poor literacy rate. This study shows predominance of female patients (54%) in comparison to male patients. This probably may be due to negligence of female child in our country. Kumar P. et al⁹

also found similar data in their study but study done by Mukerji G. et al¹⁰ and Verma SS. et al¹¹ showed male predominance. In our study, 61.4% of pediatric patients admitted were children of age group < 6 years which is similar to the study done by Kumar P. et al⁹ in which majority of cases were children of age less than 5 years. The higher incidence of this age group is probably due to inquisitive nature of children at this young age.

Cause	0-3	3-6	6-9	9-12	12-16	Total
Hot Liquid	9	13	2	1	1	26 (45.61%)
Flame	4	7	3	2	3	19 (33.33%)
Electrical and Chemical	2	2	3	3	2	12 (21.05%)

Table-2: The cause of burns in different age groups

Risk factor	No. of Cases
Combustibles, hot liquid accessible to children	48
Use of unsafe kerosene stoves/lamps	42
Housing in slums /remote areas	38
Overcrowding in the house	43
No separation between cooking area & other areas	28

Flammable / loose fitting clothes	20
Absence of parents at the time of burns	40
Unsafe electrical wiring	10
Use of fireworks	5

Table-3: Risk factors for Paediatric Burns

In this study, scalding was the most common type of burn injury (45.61%), particularly between ages of 3 to 6 years. It is similar to the various studies done earlier.^{12,13,14,15} Because of the nature of children to explore new things, they put their hands in hot water or bath tub or spill hot liquids which leads to scald burns. Electrical and chemical burn was common in the age group of 6- 12 years which constitute 50% of total number of electrical and chemical burnt pediatric patients. This result is quite similar to the study done by Rafi et al², showing 48.5% of electrical and chemical burnt patients were from age group of 7- 12 years. The number of burn injury caused by chemical and electricity increase in children after age of 6 years, owing to an increase in their activity and curiosity levels. In developing countries, it may also be attributable to the involvement of children in professional activities at such a young age.

The primary objective of our study was to evaluate the various risk factors for pediatric burn: storage of inflammable substance in home, use of unsafe kerosene stoves/lamps, unsafe electric wiring, housing and overcrowding, absence of parents at the home, use of fireworks etc. In this study, multiple factors were present in the majority of the cases simultaneously. The most common risk factors were easy accessibility to hot liquid/ combustibles (in 48 cases), overcrowding (in 43 cases), use of unsafe kerosene stoves/lamps (in 42 cases) and housing

in slums / remote areas (in 38 cases). These results are quite similar to the study done in Iran by Rafi MH et al.²

LIMITATION OF THE STUDY

Limitation of the study is that this is a retrospective study and has small sample size with short duration of study period. A more extensive research of disability due to burn injury should be conducted which will help us to form the basis of burn prevention program in India. Further we recommend research trials on selected preventions strategies. We recommend the involvement of pediatricians in prevention campaigns to raise awareness about the risk factors for burns in children and measures that can be taken to make the environment safer for children.

CONCLUSION

This study provides an overview of epidemiology of pediatric burn patients. By identifying the various risk factors in our society, most of the burn injury can be avoided by simple preventive measures. Because prevention is more cost effective than the treatment, so economic burden of the society can be reduced in developing countries like India, by removing the risk factors and simple preventive measures like proper housing, avoiding overcrowding and proper education of the family members.

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