VOLUME-6 | ISSUE-3 | MARCH - 2017 • ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

RETROSPECTIVE STUDY OF PEDIATRIC BURNS CASES AT A TERTIARY CARE REFERRAL CENTRE

Plastic Surgery

KEYWORDS: Pediatric, Burns, Prevention

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ABSTRACT

Burn injuries in developing nations are reported to be the third most common cause of death in children, after road traffic injuries and drowning, respectively, with scald burns as most common etiological factor. In our retrospective study, we tried to identify and analyze the demographic, socio-cultural aspects of burns patients, various etiological factors, patients' profile affecting the outcome and mortality rate amongst pediatric burn patients. Study was conducted at a tertiary care referral centre at Mumbai, The study sample included all consecutive admissions in pediatric age group under 18 years from 1st January 2013 to 31st December 2015.

The sample consisted of total 119 patients with 70 females. Main affected age group was 13-18 years with 39.5% (47). The peak incidence was in winters (November-February). Majority of children suffered scald burns 48% (57) due to hot liquids. Maximum patients suffered superficial to deep burns affecting 11-30% TBSA. Mortality was maximum in age group of 13-18 years 70% (17) with total mortality of 24. Mean hemoglobin was 11 gm% with mean serum albumin value of 2.95 gm%. Mean number of blood transfusions around one per patient and mean number of procedures done were 1.27 per patient. This study provides an overview of the epidemiology of pediatric burn patients admitted to a tertiary care teaching hospital in Mumbai. Most of these burn injuries can be avoided if simple preventive measures are taken. Hence, most important step is to educate the masses about burns prevention and provide better health care at the grass-root level.

INTRODUCTION:

Burn injuries in developing nations are reported to be the third most common cause of death in children, after road traffic injuries and drowning, respectively [1].In pediatric age group, lack of awareness, high level of activity, curiosity and impulsivity is responsible for accidental burn injury [2].Scald burns due to neglect outnumber those due to intentional injuries by a factor of 9:1 [3].

Burns have devastating effects on children. The effect is compounded by on-going pain, cosmetic and physical disfigurement, dressing changes, surgical procedures and functional impairment. The constant emotional and psychological impact is not only on the child but also on the care giver/ parents [4]. It also drains the family economically. An epidemiological study is the forerunner in planning preventive and management strategies, hence, such studies should be seen with aim to establish effective preventive programs and improve standard of care.

In our retrospective study, we tried to identify and analyze the demographic, socio-cultural aspects of burns patients, various etiological factors, patients' profile affecting the outcome, mortality rate amongst pediatric burn patients.

MATERIAL AND METHODS

Study design

The research followed Helsinki Guidelines; 2008 and National Guidelines for Research in Human Subjects; 2006. We conducted a retrospective audit of pediatric patients admitted with burn injury at a tertiary care burns referral centre at Mumbai, India, attached to Dept. of plastic surgery of a tertiary care teaching hospital.

Study population

Children upto the age of 18 years.

Sample

The study sample included all consecutive admissions in pediatric age group from 1st January 2013 to 31st December 2015.

Data Collection

Data was extracted and documented in data collection sheet which included information of the patient's age, gender, address, date of admission, discharge, time lag between onset of injury and visit to the hospital and hospital stay/ death. Etiology of burn based on the mode of the injury – accidental, suicidal or homicidal and based on cause of injury- scald, thermal and electrical were recorded. Sites, depth, inhalational burns and percentage of total body surface affected (TBSA) were noted. Patients' weight, routine blood investigations at the time of admission, wound cultures, number of blood transfusions and surgical procedures were also recorded.

Data Analysis

Socio-demographic factors were assessed with descriptive statistics. Means and standard deviation of the study were calculated using Microsoft Office Excel (Microsoft Excel, 2010, Microsoft India Pvt. Limited).

RESULTS

The sample consisted of total 119 patients with 49 males and 70 female with male to female ratio of 1:1.43. Maximum number of patients were in the age group 13-18 years i.e. 39.5% (47). The peak period of occurrence was in winters (November-February). Majority of children suffered scald burns 48% (57) due to hot liquids, however five patients died of self-immolation. Maximum patients suffered superficial to deep burns affecting 11-30% TBSA. Mortality was maximum in age group of 13-18 years 70% (17) with total mortality of 24. Mean hemoglobin was 11 gm% with mean serum albumin value of 2.95 gm%. Cultures taken on day five or infected wounds presenting late to us, showed pseudomonas aeruginosa and klebsiella pneumonae as the most prevalent organisms. Mean number of blood transfusions around one per patient and mean number of procedures done were 1.27 per patient. Number of procedures were more in patients suffering from higher percentage of TBSA burns.

Figure 1. Gender distribution

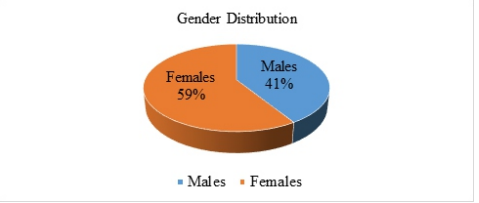

Table 1. Age-wise distribution

Age in years	Number of patients (n=119)	Percentage (%)
0-1	9	7.5
1-5	32	26.9
6-12	31	26.1
13-18	47	39.5

Table 2. Cause of burns

Cause	Number of patients (n=119)	Percentage (%)
Accidental thermal	50	42
Scald burns	57	47.9
Accidental electrical	7	5.9
Suicidal	5	4.2
Homicidal	0	0
Preventable causes	113	95

Table 3. Percentage of TBSA Burns

% TBSA burn	Number of patients (n=119)	Percentage (%)
1-10	19	16
11-20	30	25.2
21-30	22	18.5
31-40	18	15.1
41-50	16	13.5
>50	14	11.7

Table 4. Patients' clinical parameters

	Mean of the study group with standard deviation
Weight	27.1 + 15.45
Hemoglobin (gm%) at admission	11 + 2.15
Total leucocyte count in / mm^3 at admission	15,422 + 9,480
Platelet count lakh/mm^3 at admission	3.3 + 1.57
Serum albumin in gm% at admission	2.95 + 0.82
Culture positive wounds	102

DISCUSSION

In this study, burn injury was highest among the adolescent age group, 39.8% (47) and second highest in age group of 0-5 years, 32.3% (39). This finding is at par with the finding of Hansbrough JF, Hansbrouggh W, 1999, that shows incidence of burns in pediatric population has bimodal distribution with high incidence in 0-4 years and number rising again at adolescence [5]. This could be explained by the fact that in lower socio-economic strata, young girls start cooking at a very young age of 10-12 years, with little awareness of safety norms in kitchen and young boys getting exposed to outside environment for work.

This study revealed that majority of the patients were females 59% (70) with male to female ratio of 1:1.43. This finding was consistent with other studies [5]. Maximum number of patients 48% (57) suffered from scald burns due to hot liquid. This finding was also seen in other studies in India [5-7]. The main reason for scald burns being overcrowded homes with boiling liquid placed on a chullah / kerosene or gas stove at ground level, getting spilled. Most of these injuries could have been prevented had water container and cooking area been at a higher level, out of the reach of children or if the temperature of the bath water was tested first. Second most common cause was thermal burn injuries with main contributor being fire-cracker burns during Diwali season. Similar findings were observed in the study by Verma et. al.[7]. In our study, an important fact that came out was that almost 95% (113) of these cases were preventable. This stresses the importance of burns prevention education among masses.

Another distressing fact that this study brought forth is the rising incidence of suicidal cases among adolescents. 10% of the 47 patients aged 13-18 years suffered from suicidal burns. This finding is consistent with other studies [3]. This indicates a need for improvement of psychosocial support and suicide prevention strategies among adolescents.

In this study, 90% (108) patients were from Mumbai and 10% (11) from rural area.

In this study, 70% (17) mortality occurred among age group of 13-18 years. This could be due to this group patients suffered from more severe burn injuries. Inhalational burn injuries were most common denominator in mortality group with 87% suffering from it. This finding was similar to study of Peddi et. al. [5].

The mean hemoglobin level in our study was 11$\pm$ 2.14 gm%. Serum albumin level of patients who succumbed was 2.17 gm% while those who survived had 3.14 gm%. This might suggest that hypoalbuminemia might be an important predictor of outcome in burn injury. Similar finding was found in other study [8].

In our study, pseudomonas aeruginosa and klebsiella pneumonae were the most prevalent organisms affecting 69% (82) of patients. Mean number of blood transfusions was closer to one per patient and mean number of procedures done were 1.27 per patient. Number of procedures were more in patients suffering from higher % of TBSA burns reflecting the need for aggressive management of these patients.

Limitations of the study: Under reporting of exact causes of burns for fear of social stigma, small sample size, tertiary hospital based study which may not be entirely representative of the population.

CONCLUSION:

This study provides an overview of the epidemiology of pediatric burn patients admitted to a tertiary care teaching hospital in Mumbai. Most of these burn injuries can be avoided if simple preventive measures are taken. Rise of suicidal burns among adolescent age group is a matter of concern and thorough measures need to be taken for improving the mental health of our adolescent population. Thus, the most important step is to educate the masses about burns prevention and provide better health care at the grass-root level.

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