

# A RETROSPECTIVE CLINICO-EPIDEMIOLOGICAL STUDY OF BURNS VICTIMS AT A TERTIARY CARE HOSPITAL BURNS UNIT AT MUMBAI, INDIA

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**ABSTRACT** Burn injury continues to be a major challenge in today's developed world. Epidemiological studies are a source of information that help in plan and management of complex diseases. This study describes data of burn victims in terms of aetiology, demography and outcomes at tertiary burns hospital. Between January 2016 to October 2021 557 patients underwent treatment at this unit. The mean age was 21-40 years, the mean percentage of body surface area of burn wounds was 38.52 %. Flame burns were the commonest cause of the burn. Bacteriology test revealed the commonest organisms as Pseudomonas and Klebsiella. The mortality rate was 41%. Burns injury is an ongoing problem that requires special intervention methods for its prevention.

**KEYWORDS** Burns, Epidemiology

## Introduction

A burn is defined as coagulative necrosis of the surface layers of the body [1]. There is no greater trauma than a major burn injury. Burn injury historically carried a poor prognosis. However, nowadays, surgical care of the burned patient has evolved into specialized field incorporating the interdisciplinary skills of burn surgeons, nurses, burn physiotherapists and other health-care specialists. With the advances in fluid resuscitation and the advent of early excision of the burn wound, survival has become an expectation rather than an exception [2]. In spite of these advances, burns continue to be a major challenge due to limited resources, lack of public awareness and lack of specialist expertise. In India, over a million people are affected with moderate and severe burn injuries every year, reports [3]. Epidemiological studies are the necessary intervention in the care of burns. Precise epidemiological information is needed for proper planning

of the treatment strategy, to reduce complication and mortality and to improve the overall standard of care. This study is aimed to analyze epidemiological data of the burns from the tertiary care hospital, including demographic, etiological factors and to correlate them with the outcome.

## Materials 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 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

All the patients with burn injuries from tertiary care hospitals.

### Sample

The study sample included all consecutive admissions of burns patients from 1 January 2016 to 31 October 2021

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## Data Collection

Data were extracted and documented in a data collection sheet which included information on the patient's age, gender, address, date of admission, discharge, hospital stay, outcome (discharge/ death). Aetiology of burn based on the mode of the injury – accidental, suicidal or homicidal and based on the cause of injury- scald, thermal and electrical were recorded. The presence of inhalational burns and the percentage of total body surface affected (TBSA) was noted. The patient's haemoglobin and serum albumin levels at the time of admission wound cultures, the number of blood transfusions and surgical procedures were also recorded.

## Data Analysis

Socio-demographic factors were assessed with descriptive statistics. The means and standard deviation of the study were calculated using Microsoft Office Excel.

## Results

### Age and sex

A total sample consisting of 557 patients were admitted in the given time period, with 331 male and 226 female patient's. Male: female ratio of 1.4:1 as shown in figure 1. The mean age of the study group was 29.2 years, with the most affected age group being 21-40 years with 45.4% (253) patients, as shown in Table 1.

### Severity

A variety of burn patients were admitted, with the mean percentage of body surface area involved being 38.52%, percentage-wise distribution shown in Table 2.

### Hospital stay

Mean Duration Of Hospital Stay Was 27.5 Days.

### Aetiology

The most common aetiology of burns in patients admitted with us was flame burns, amongst which stove blast was the most common cause, as shown in Figure 2. A total of 302 out of 525 accidental thermal burns occurred around the cooking area. At the time of injury, 61.3% (322) patients were wearing cotton clothes, and 38.6% (203) were wearing nylon clothes. Out of 557 patients, 81 were presented with inhalational burns.

### Nutrition

Mean haemoglobin was 12.24 gm% with mean serum albumin being 2.74%

### Microbiology of wounds

Wound swab cultures on day five or infected wounds presenting late to us showed *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* as the most prevalent organisms.

### Mortality

41% (230) of patients succumbed to their injuries.

This analysis was done on 557 burn patients over a 6 year period admitted to a burn unit at a tertiary care teaching hospital in Mumbai, India.

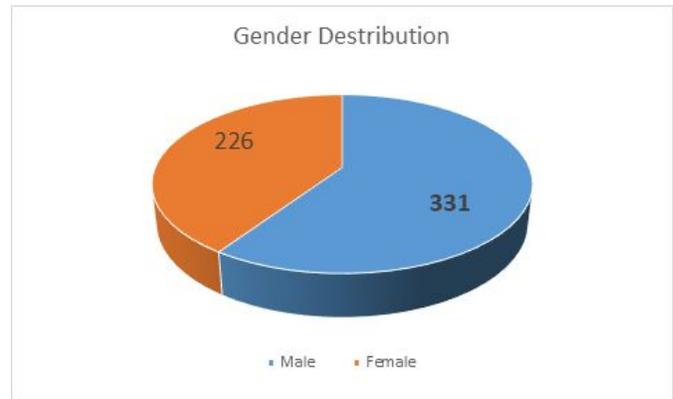


Figure 1: Gender Distribution.

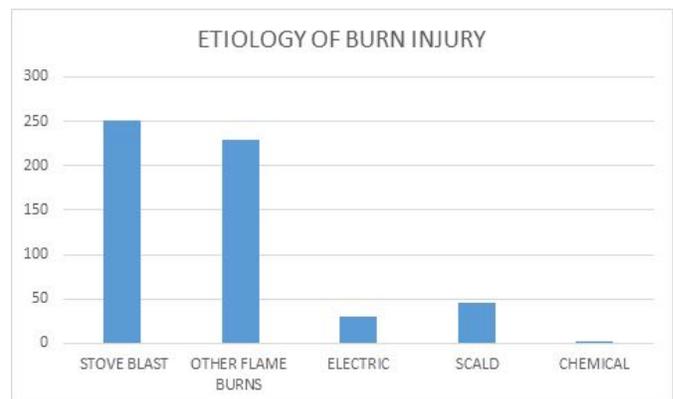


Figure 2: Aetiology of Burns.

## Discussion

### Age and sex

In this study, the male population (59%) were more prone to burn injuries than the female population (41%), with a male to female ratio of 1.4:1. It was comparable with the other studies [4]. Most burn cases belonged to the age group 21-40 years, mainly attributed to being the most active and productive age group. Similar findings were observed by the other studies [5,6,7].

### Severity

In the present study, mean TBSA burn was 38.52%, with more than 50% of patients sustaining major burns involving >40% body surface area, which is consistent with other studies [8,9]. The reason behind the higher severity of the burns can be the delay in dousing the fire or non-referral of minor burn cases to the tertiary hospital.

### Hospital stay

The mean duration of the hospital stay coincided with the degree of burns, with patients having >40% TBSA burns having longer hospital stay (mean of 48 days) amongst those who survived. This finding was consistent with other studies [8].

### Aetiology

In our study, we also found that 302 out of 525 accidental thermal burns happened around the cooking area. The different types of burns seen were flame burns, scald burns due to spillage of water

**Table 1** Percentage wise age of burn victims.

AGE IN YEARS	NO. OF PATIENTS	PERCENTAGE
0-20	168	30
21-40	253	45.4
41-60	99	17.7
61-80	34	6.1
>80	3	0.5
<b>TOTAL</b>	<b>557</b>	<b>100</b>

**Table 2** Percentage of burn wounds in burn patients.

PERCENTAGE OF TOTAL BODY SURFACE AREA BURN	NO. OF PATIENTS	PERCENTAGE
1-10	76	13.6
11-20	94	16.8
21-30	86	15.4
31-40	81	14.5
41-50	71	12.7
51-60	47	8.4
>60	102	18.3
<b>TOTAL</b>	<b>557</b>	<b>100</b>

or oil, cylinder blasts etc. Most of these incidents were due to negligence, overcrowding, carelessness about loose clothing and other factors. This underlines the immediate need of creating awareness amongst the young population regarding fire safety around the cooking area. A major bulk of female burn patients involved were housewives who spent most of their time working in the kitchen. Moreover, families belonging to lower socio-economic strata were cooking on the floor with kerosene stoves, wearing clothes that easily caught fire, had stock or access to loose kerosene and had little or no awareness of safety measures in the kitchen.

### Nutrition

Mean haemoglobin was 12.24 gm%. Mean serum albumin was 2.74gm%, and as the severity of burns increased, the serum albumin levels decreased. Hypoalbuminemia is associated with a higher percentage of burns, and this finding was consistent with other studies [11].

### Microbiology of wounds

The most common organisms isolated from the burn wounds were *Pseudomonas Aeruginosa* and *Klebsiella Pneumoniae*.

### Mortality

In our study, the mortality rate was 41% which was comparable with other studies [8,10]. Limitations of the study: This study was based on history narrated by patients or caretakers; hence complete evaluation of facts may not be possible. Under-reporting of exact causes of burns, small sample size, a tertiary

hospital-based study which may not be entirely representative of the population.

### Conclusion

Our study was focused on the study of epidemiological and clinical profiles of burns patients. The ultimate goal of prevention of burn injuries can only be achieved by collaborative efforts of all the concerned authorities to spread awareness about fire safety, educate the masses about burn prevention and safety measures. Government can play a pivotal role by implementing a national programme for the prevention and management of burn injuries.

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### Conflict of interest

There are no conflicts of interest to declare by any of the authors of this study.

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