

## Profile of deaths due to burn injuries: A retrospective study of eight years in a tertiary care centre in Western Maharashtra

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### Abstract

**Introduction:** In India 7 million people suffer from burn injury, out of which, 7 lakh need hospital admission and 2.4 lakh become disabled. Burn injuries have varied aetiological factors with varied demographic profile. The cause of death is in direct link to percentage and depth of burn injuries. Hence, this study was undertaken to study the profile of burn patients and come to conclusion of the aetiological factors leading to mortality in burn cases.

**Aims & Objectives:** To describe the profile of burn injuries related death based on retrospective study of eight years in a tertiary care centre in Western Maharashtra, and to study the burn injuries fatalities based on age, sex, place of residence, cause of injuries body surface area affected and cause of death.

**Materials & Methods:** A 8 year retrospective data of all the autopsies conducted where the cause of death was due to burns were studied as per aim and objective of study. The data from 2011 to 2018 were studied.

**Results:** A total of 87 cases died due to burn injuries in the period from 2011 to 2018. Total autopsies conducted for all cases at the centre were 1976. Maximum cases were seen (42.72%) in 16-30 years age group. 75.86 % were female victims. The urban setting was involved in 37.93 % and rural setting was in 66.87%. The cause of death was septicemia in 68 cases, shock in 12 cases, asphyxia in 5 cases and renal failure in 2 cases. The most common percentage of burns leading to fatalities was above 60 % burns. As per the cause, 75.86% cases were due to flame burns.

**Conclusion:** The epidemiological factors of the burn injuries are varied in different regions of world. For effective planning and preventing burn injuries, the approach has to be multi pronged like awareness, education and early treatment.

**Keywords:** Profile, Burns, Septicaemia.

### Introduction

Man invented fire since ages. The use of fire was used for basic comforts and to sustain lives. Without fire life on earth was near impossible but it also added to risk of lives by increasing the risk of burns injuries. Fatal burns have continued to be a major public health problem in India. It is a misery which involves all strata of society and involves high risk of morbidity and mortality. Fire is present in all our homes, be it city or village. In India, about 60,000 people suffer from burns annually, more than 50,000 are treated in hospitals and about 10,000 succumb to thermal injuries. Microbial infections after burns, where a large portion of the skin is damaged, is a very serious complication that often results in the death of the patients. About 45% of the mortality in burn patients is caused by septicemia.<sup>1</sup>

As per the data extrapolated from the information received from three major government Hospital in Delhi, approximately 1.4 lakh people die of burn injuries annually. This comes to one death every 4 minutes due to burns; however, burn injury is mostly unrecognized in our country.<sup>2</sup>

Burn injuries have varied aetiological factors with varied demographic profile. The cause of death is in direct link to percentage and depth of burn injuries. Hence, this study was undertaken to study the profile of burn patients who had reported for medicolegal autopsy and data was analysed based on the aetiology, demographic profile and

cause of death. The study was aimed to suggest preventive measures after analysing the data on a 8 year retrospective study in a tertiary care centre.

### Aim

To describe the profile of burn injuries related death based on retrospective study of eight years

### Objectives

1. To study the burn injuries fatalities based on age, sex and place of residence.
2. To study the fatalities type, causes, body surface area affected and cause of death.
3. To suggest preventive measures.

### Materials and Methods

#### Study settings and population

The study was conducted on all burn injuries brought to medicolegal postmortem centre for autopsy at a Tertiary Care Hospital in Western Maharashtra.

### Inclusion criteria

All the deaths due to burn injuries brought for autopsy at the medicolegal postmortem centre of tertiary care hospital.

### Exclusion criteria

1. Decomposed bodies
2. Deaths associated with other serious life threatening traumatic injury like head injury which may have direct effect on cause of death.

### Sample size with justification

A 8 year retrospective data of all the autopsies conducted where the cause of death was due to burns were studied as per aim and objective of study. The data from 2011 to 2018 were studied. A total of 1976 autopsies were conducted during the study period in the medicolegal postmortem centre. In this the 87 case were there where the cause of death was due to burns involving flame, liquid, chemical and electrical burns.

### Measurement and Analysis

The postmortem report was studied and data noted as per aim and objective of study and data recorded in a profroma. Data was analysed using excel sheet and statistical calculations done.

### Results

A total of 87 cases died due to burn injuries in the period from 2011 to 2018. Total autopsies of all cases conducted at the centre were 1976. The male were 21(24.13%) cases and females 66(75.86%). The age group showed 05 cases in 0-15years age group, 37 case in 16-30 years age group, 16 cases in 31 to 45 years age group, 17 cases in 45- 60 years age group and there were 12 cases above 60 years of age. The urban setting was involved in 33 cases and rural setting was in 54 cases. The cause of death was septicemia in 68 cases, burn shock in 12 cases, asphyxia in 5 cases, renal failure in 2 cases. The most common percentage of burns was above 60 %( 68 cases), 31% to 60 % burns were seen in 17 cases and 2 cases had below 30 % burns. As per the cause, 64 cases were due to flame burns, 12 cases due to falling of liquids like water and oil, 7 cases were due to chemical burns and 4 cases were due to electrical burns.

### Discussion

In our present study (Table 1) the maximum fatalities are in age group 15 to 30 age group (42.52%). In a study published in Egypt it was found that the highest percentage of the cases of burns was found in age group 0 to 10 years, the total number was 127 cases, which represented 57.3% of the total cases in year 2015 and 74 cases, which represented 46.8% of the total cases in year 2016.<sup>3</sup> In a study published in Karnataka<sup>2</sup> it was found that 14-30 age group showed max burn injury cases(41.8%) .In a study conducted at Nagpur<sup>4</sup> it was found that the peak incidence was between age group 21 years to 30 years ie 47.1%. Our findings are similar to findings to Indian study.

As per the sex distribution, the present study shows 75.86% (Table 2) are female victims. This is in consistent with a study done in North India<sup>5</sup> which showed 63 % as female victims. In a study conducted by Shankar et al in North Karnataka<sup>6</sup> it was found that 55.83% of victims were

females. All these studies show a higher female percentage of victims in cases of burns. Females are more exposed to fire as they cook on regular basis. Also the females way of dressing like dupattas and wrapped saris could also contribute to higher percentage of burn injuries in female sex.

As per place of residence in our study it was found out that 66.87% were from rural settings and 37.93% were from urban settings. (Table 3) In study conducted in North Karnataka<sup>6</sup> it was found out that 55.42 % of cases occurred in Kutcha houses in rural settings. Similar findings have been seen in study from Bombay<sup>7</sup> and Indore.<sup>8</sup> The reason behind is more dependence on conventional cooking methods and lack of awareness of the lethality of burn injuries in rural settings.

In our study (Table 4) the most common cause of burn deaths are flame burns (75.86%). Other studies done in West Bengal<sup>9</sup> showed house-hold flame was responsible for 61.45% of all burn cases. In a study in Indore it showed that flame burns were responsible for 80.3% of cases.<sup>10</sup> In a study at Delhi most of the burn cases were of flame burn (97.10%) and only few cases (2.89%) were of scalds.<sup>11</sup> The higher percentage of flame burns could be attributed to exposure to flames while cooking and also to kerosene in rural settings.

In our present study (Table 5) maximum fatalities were seen in above 60 % group(78.16%). Other studies done in Delhi<sup>11</sup> in a tertiary care showed in 46.37% cases total body surface area of burn was between 90 to 100% followed by 80-90% in 14 % cases. Palimar V et al, reported 54.9% with burns above 60% of total body surface area.<sup>12</sup> In a study at Loni<sup>13</sup> in Maharashtra it was observed that more than 80% of body surface area was involved in 41.875%. The findings were not consistent with the study of Usama B<sup>14</sup> et al 25 where 26% to 50% was most commonly affected victims. It is very certain that the deaths are in directly proportional to percentage of burns. Hence all studies with higher percentage of burns show higher mortality.

In our present study (Table 6) it shows the most common cause of death is Septicaemia (78.16%). Other were shock in 12 cases, asphyxia in 5 cases and renal failure in 2 cases. In a study at Delhi<sup>11</sup> it was observed that 46.85% died of shock and 53.14% victims died of septicemia . Another study reported a majority of deaths (55%) due to septicemia as the major cause of death<sup>15</sup> . In another study on 352 patients, 16 deaths occurred and the final causes of death were septicaemic shock in 10 patients, adverse drug reaction in one patient and bleeding peptic ulcer in one patient.<sup>16</sup>

**Table 1:** Age Distribution

Age group	Number of Cases	Percentage
0-15 years	05	5.74
16 -30 years	37	42.52
31-45 years	16	18.39
46-60 years	17	19.54
Above 60 years	12	13.79

**Table 2:** Sex Distribution

No. of Males	Percentage of Males	Number of Females	Percentage of Females
21	24.13	66	75.86.

**Table 3:** Place of Residence

Place of Residence	Number of Cases	Percentage of Cases
Rural Setting	54	66.87
Urban Setting	33	37.93

**Table 4:** Cause of Burn Injuries

Cause of Burn Injuries	Number of Cases	Percentage
Flame Burns	66	75.86
Scalds	12	13.79
Chemical Burns	07	8.04
Electrical Burns	02	2.29

**Table 5:** Percentage of Burns

Percentage of Burns	Number of Cases	Percentage
Above 60	68	78.16
31- 60	17	19.54
0-30	02	2.29

**Table 6:** Cause of Death

Cause of Death	Number of Cases	Percentage
Septicaemia	68	78.16
Burn Shock	12	13.79
Asphyxia	05	5.74
Renal Failure	02	2.29

## Conclusion

The epidemiological factors of the burn injuries are varied in different regions of world. For effective planning and preventing burn injuries, the approach has to be multi pronged and this can largely be accomplished by taking the measures like a high sense of awareness about the lethality of burn injuries, educating people about safe cooking and taking personal preventive measures and finally early reporting of cases to higher centres to ensure effective treatment.

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