Five Year Retrospective Study of Profile of Burn Deaths from Pune Region

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Abstract

A burn is an injury which is caused by application of heat or chemical substances to the external or internal surfaces of the body, which causes destruction of the tissues. The magnitude of deaths due to burns is so large in our country that India is the only country in the world where fire is classified among the fifteen leading causes of death. The purpose of this study is to analyze profile of burn deaths in the Pune region of Maharashtra. In the present study among the 1710 burn deaths, females (70%) are more commonly affected than males (30%). Young adults (21–40 yrs) are commonly involved in fatal burns as this is most active group of population. In present study majority cases happened in summer season and were accidental in nature while suicidal deaths were present in significant number. Flame burns comprised of 80% of the cases followed by scald 13%. In 78% of cases more than 50 % of total body surface area was involved while complications like Septicemia (66%) was commonest cause of death.

Key Words: *Burn deaths, Pune region.*

Introduction

A burn is an injury which is caused by application of heat or chemical substances to the external or internal surfaces of the body, which causes destruction of the tissues; thermal deaths are those which results from the effects of systemic and/or localized exposure to excessive heat and cold [1]. Thermal burns and related injuries are major cause of death and disability. Even in developed countries more than two million individuals annually are burned seriously and require medical treatment[2]. The magnitude of deaths due to burns is so large in our country that India is the only country in the world where fire is classified among the fifteen leading causes of death[3]. The prognosis of the burn injuries depends more upon the extent of body surface involved than upon degree/depth of the burns, which is traditionally determined by the rule of nines[4]. Burns are injuries produced by the application of dry heat such as flame, radiant heat or some heated solid substance to the surface of the body; while scald is moist heat injuries produced by 5. Most of the deaths from burn injuries occur from shock within 24-48 hours; death due to toxaemia usually occurs within 4-5 days6. The purpose of this study is to study and analyze epidemiology with respect to age, sex, season and manner of death wise variation of burn deaths, also further study in detail for agent responsible for burns, percentage of total body surface area burned and cause of deaths in the Pune region of Maharashtra and to compare them with other studies.

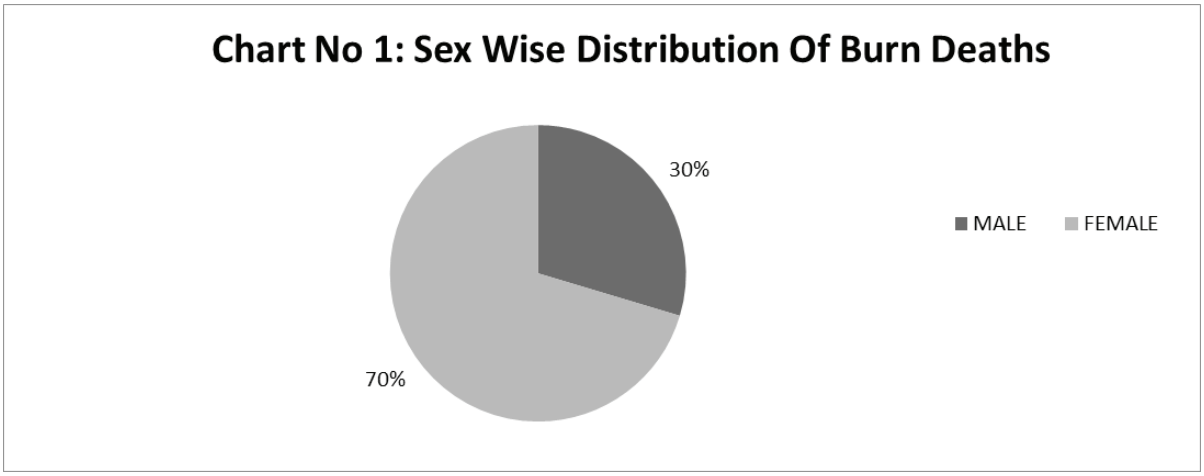
Material and Method

In the present study, the medicolegal autopsies conducted between January 2015 to December 2019 at B.J. Government Medical College and Sassoon General Hospital, Pune, Maharashtra are analyzed retrospectively. Necessary information for the study is gathered from Police inquest report, hospital treatment records and discussion with the relatives, friends, and neighbors of the victims. The cases are studied to know the incidence of burn deaths with respect to age group, sex, and seasonal variation, further studied for manner of death, agent responsible for burns, percentage of total body surface area burned and cause of death wise variation of burn deaths.

Observations and Discussion

During the study period total 1710 medicolegal autopsies in burn deaths were conducted at B.J.

Government Medical College and Sassoon General Hospital, Pune.

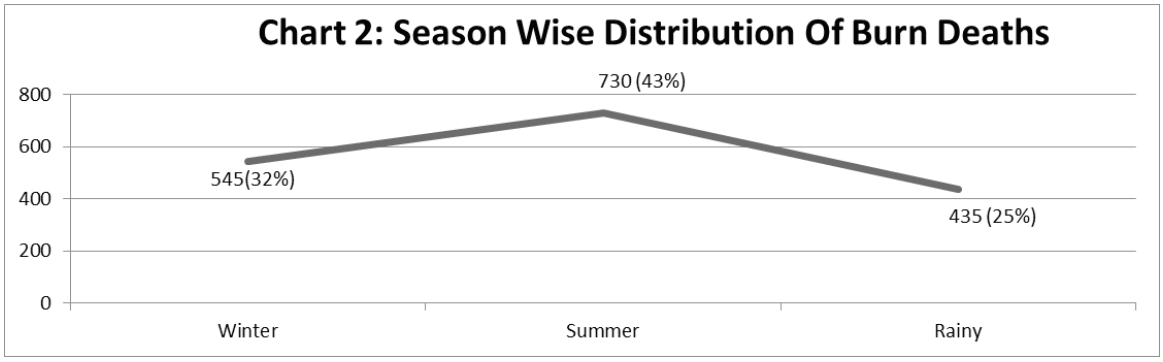


In the present study, females (1185) i.e. 70% were more commonly affected than males (525) i.e. 30% (Chart 1); similar findings were observed by Batra et al3, Ambade et al6 and Subrahmanyam M7; this can be explained by in India females being largely involved in domestic kitchen work that too at a very young age, with kitchen related activities place them at high risk of fatal burn accidents and also in our developing country child marriages and heinous dowry system being still prevalent likely leads to depression- suicide deaths and homicidal dowry deaths by burning incidents. The studies carried out in other developed countries showed male predominance like that in Japan 8, China9, Singapore 10 and South Korea 11 and which may be explained by the fact that because of rapid industrialization in these countries, male become more susceptible to fatal burns at work place.

Table 1: Age Wise Distribution of Burn Deaths

Age group of deceased	**Burn deaths**
0 to 10 years	148
11 to 20 years	150
21 to 30 years	475
31 to 40 years	292
41 to 50 years	234
51 to 60 years	70
61 to 70 years	186
More than 70 years	155
Total deaths	1710

In the present study, highest number of deceased belonged to age group of 21 to 30 years, followed by 31 to 40 years (Table 1).These findings are consistent with studies conducted by Ambade et al6, Subrahmanyam M7 and Singh D et al12 this can be attributed to the fact that age group 21–40 yrs belongs to young adults, which are commonly involved in fatal burn accidents in India as it is the most active group of population so more likely to be exposed to stress and family violence and burns may occur while working where awareness and adequate safety measures are not in place.

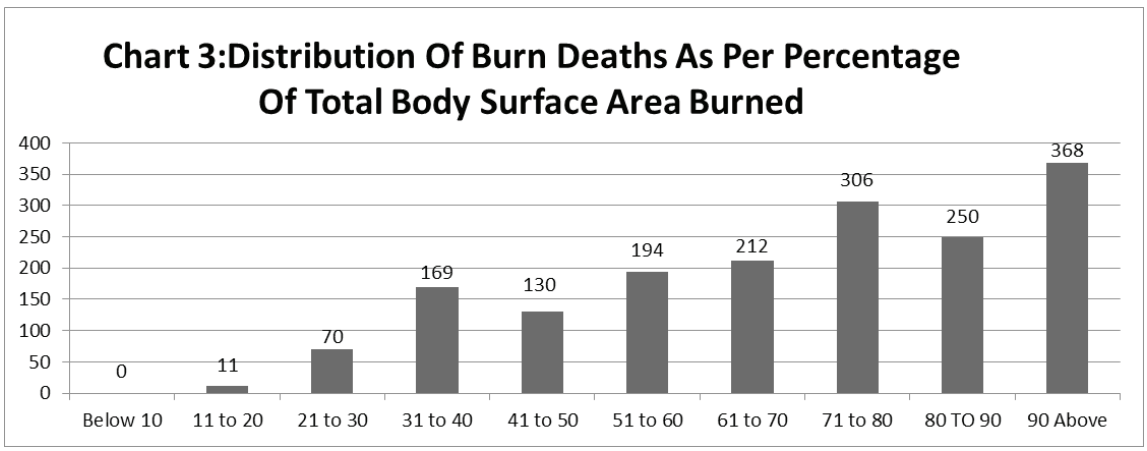


In the present study, when the burn deaths were analyzed in accordance with season, majority of cases 730 were in summer days followed by 545 in winter and then lowest 435 in rainy season (Chart 2).

Table 2: Manner Wise Distribution of Burn Deaths

Manner	Accidental	Suicidal	Homicidal	Total Deaths
Burn deaths	1308	326	76	1710

In present study out of 324 burn deaths, majority cases i.e. 1308 (79%) were Accidental deaths while 326 cases were Suicidal and 76 cases were Homicidal in nature (Table 2). These findings are consistent with studies conducted by Batra et al4, Ambade et al5, Singh D et al6 and Subrahmanyam M7, this maybe because of frequent exposure to cooking, inadequate knowledge of handling high pressure stoves, too much demand of work leading to hurried job and accidents, the cooking activities involving fire associated with wearing of loose synthetic material leads to accidental burns. Suicidal and homicidal deaths were more common in married females. The reason for this may be old custom of dowry and marital disharmony which compel the married females either to commit suicide or they may be killed by their in-laws and husband.



In the present study, it is observed that in 1330 cases (78%) more than 50 % of total body surface area was involved while in 380 cases (22 %) it was less than 50% (Chart 3); this is consistent with studies conducted by Mangal HM et al13, Zanjad NP et al 14 and Chawla R et al15, which showed 77.34%, 84.4% and 86% cases respectively for surface burns more than 50% of total body area. It suggest that as the percentage of total body surface area burned involved goes on increasing the mortality rate in the patients increases.

Table 3: Responsible Agent Causing Burn wise distribution of Burn deaths

Agent Responsible For Causing Burn	Number of Burn deaths
Flame	1368 (80%)
Scald	216 (13%)
Electric	114 (6%)
Chemical	12 (1%)
Total deaths	1710

In the present study, flame burns comprised of 1368 (80%) of the cases, followed by scald 216 (13%) and electric burns 114 (6%) while chemical burns were observed in 12 cases (Table 3). These findings are consistent with studies conducted by Batra et al4, Ambade et al5, Singh D et al6 and Subrahmanyam M7.

Table 4: Cause of death wise distribution of Burn deaths

Cause of death	Number of Burn deaths
Shock (Hypovolemic or Neurogenic)	112 (34%)
Complications like Septicemia	212 (66%)
Total deaths	1710

Immediate cause of death in burns is due to primary or neurogenic shock, secondary shock can cause death within 24 to 48 hours While after about 3-4 days toxaemia, septicaemia, acute renal failure, respiratory complications, thromboembolism causes death and after one week multiple factors comprise are sepsis, nutritional deficiencies, gangrene, etc. come in picture1. In present study, shock was cause of death in 112 numbers of cases while in majority of cases ccomplications like Septicemia were commonest cause of death. Similar findings noted by the studies conducted by Batra et al4, Ambade et al5, Singh D et al6 and Subrahmanyam M7 , Bangal et al16 and Gupta el[17] .

Summary and Conclusion

The present study can be summarized and concluded as; burn deaths are presented in significant number in day to day medicolegal autopsies. Among burn deaths, females are more commonly affected than males. Young adults (21–40 yrs) are commonly involved in fatal burns as this is most active group of population. In present study majority cases are Accidental and Suicidal deaths are present in significant number. It was found that flame burns caused majority of the cases, followed by scald while as the percentage of total body surface area burned involved goes on increasing the mortality rate increases and complications like Septicemia were commonest cause of death. The results of this study suggest a strong relationship between particular age

group and sex affected, manner of death, different causes of deaths; while focusing on these, attempts can be made to strategies therapeutic directions, medical and social interventions quite rightly to save life from burn deaths.

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Ethical Clearance: None.

Conflict of Interest: Nil

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