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ORIGINAL RESEARCH

Profile of death in burn cases in a tertiary care centre: two year retrospective study

Dr. Alwin Varghese[1], Dr. Rajiv Joshi[2]

[1]Assistant Professor, Department of Forensic Medicine and Toxicology, Soban Singh Jeena Government Institute of Medical Sciences and Research, Almora, Uttarakhand, India
[2]Professor and Head, Department of Forensic Medicine and Toxicology, Guru Gobind Singh Medical College and Hospital, Faridkot, Punjab, India

Corresponding Author
Dr. Alwin Varghese
Assistant Professor, Department of Forensic Medicine and Toxicology, Soban Singh Jeena Government Institute of Medical Sciences and Research, Almora, Uttarakhand, India
Email: varghesealwin1990@gmail.com

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ABSTRACT

Background: Death as a result of burns is due to application of dry heat to the body. The etiopathological pattern of burns varies from region to region. Injuries caused due to burns are encountered as medical emergencies in any hospital in India. The medico-legal importance of burns is immense, as they may be considered to be the commonest cause of unnatural death in India. **Objective:** The main objective of this study was to gather epidemiological information, to find out the pattern and causes of death in different cases of burns. **Method:** The present study was based on retrospective analysis of burn cases in the period from January 2021 to December 2022 from autopsies done in the Department of Forensic Medicine and Toxicology, Guru Gobind Singh Medical College and Hospital, Faridkot, Punjab. **Results:** There was no significant difference in the sex wise distribution in our study. All the cases were hospitalized and septicemia contributed to cause of death in majority of cases. **Conclusion:** Mass Education and role of Government and NGO's play an important role in creating awareness of public at large.

Keywords: Burn, Body surface area, Accidental burn, Manner of death

INTRODUCTION

Burn is an injury which is caused by application of heat by conduction, radiation or chemical substance to the external or internal surface of the body which causes destruction of tissue.[1] The etiopathological pattern of burns varies from place to place.[2] Death due to burns is only a part of the problem, the major challenge is prolonged morbidity resulting in stigma and rejection in society.

Burns are the fourth most common type of trauma worldwide, following road traffic accidents, falls and interpersonal violence. Accidental burns is the most common cause of flame burns.[1]

Death due to fire is one of the major fatality, both from the autopsy and investigation point of view. Due to involvement of multiple investigation teams to a fire death scene, there is associated inevitable contamination of the scene. The Initial investigation is done by the fire department personnel armed with powerful hoses, followed by the law enforcing agencies and lastly by the medical examiner and his/her team.[3]

Developing countries have a high incidence of burn cases, creating a major public health issue. High population density and poverty are the main factors associated with a high risk of burn injury. Our Country with a population of over a billion, has 700000 to 800000 burn admissions annually.[4] The present study is based on retrospective analysis of medico-legal burn cases in the period from January 2021 to December 2022 from autopsies done in the Department of Forensic Medicine and Toxicology, Guru Gobind Singh Medical College and Hospital, Faridkot, Punjab.

AIMS AND OBJECTIVES

The main objective of this study was to gather epidemiological information, to find out the pattern and causes of death in different cases of burns.

MATERIAL AND METHOD

This study was based on retrospective analysis of 47 burn deaths from 1st January 2021 to 31st December 2022 from the postmortems done in the Department of

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Forensic Medicine and Toxicology, Guru Gobind Singh Medical College and Hospital, Faridkot, Punjab. The data represents all age groups. Performa for study was prepared and various information and findings were collected from the Inquest papers, autopsy reports and hospital record like age, sex, religion, cause of death, duration of death, hospitalization and survival time. The information was compiled, tabulated and analyzed.

OBSERVATION AND RESULTS

During the two year study period from 1st January 2021 to 31st December 2022, a total of 1330 autopsies were conducted, out of which 47 cases (3.5%) were due to burn. There was no significant difference in the sex wise distribution of burn cases. (**Table 1**) Burn injuries can occur at any age but the most affected age group in this study was between 21-50 years i.e. 33 cases (70.2%), followed by 11-20 years i.e. 05 cases (10.6%). Least number of cases were from 0-10 years i.e. 02 cases (4.2%). (**Table 2**)
(**Graph 1**).
Religion wise distribution of cases included Sikhs (70.3%) and Hindus (29.7%). (**Table 3**). Thermal burns contributed to most of the cases, 39 (89%), followed by electric current burns, 8 (17%). (**Graph 3**). Majority of victims (70.2%) were married (**Graph 4**) and among them, 19 (57.5 %) were females in our study. (**Table 4**). In present study out of all burn cases, eleven cases (21%) were having carbon soot particles in trachea (**Graph 2**). Among all burn victims, all the cases were hospitalized while no case was brought dead (**Table 5**). Among the hospitalized cases, 6 cases (12.6 %) died within 24 hours, 4 cases (8.6 %) died within 1- 2 days, 19 cases (40.4%) died within 3- 6 days, and 13 cases (27.8 %) died within 7- 10 days while 5 cases (10.6 %) died 10 days after hospitalization. (**Table 6**). In majority of burn cases (61.6% cases), total body surface area involved was between 40- 70 %, followed by 21.3 % cases with 70-100% body surface area and 17.1 % cases died with total body surface area less than 40%. (**Table 7**). In this study, majority of victims died due to septicemia (74.4 % cases), followed by burn shock (17.1 %) and toxaemia in 8.5 % cases. (**Table 8**). Majority of the injuries were accidental in nature i.e 42 (89.4%), followed by suicidal burn, 5 (10.6%). No deaths were allegedly homicidal in nature in our study. (**Table 9**). Most of the cases (61%) in our study occurred between November to march. (**Table 10**).

Table 1: Sex-wise distribution of Burn cases

Sex	Burn cases	Percentage
Male	24	51.1
Female	23	48.9
Total	47	100

Table 2: Age- wise distribution of Burn cases

Age groups	Cases	Percentage
0-10	02	4.2
11-20	05	10.6
21-30	11	23.4
31-40	11	23.4
41-50	11	23.4
51-60	04	8.5
61-70	03	6.5
Total	47	100

Table 3: Religion- wise distribution of Burn cases

Religion	Male	Female	Percentage
Hindu	07	07	29.7%
Sikh	18	15	70.3%
Total	25	22	100%

Table 4: Marital status

Gender	Married	Unmarried	Percentage
Male	14	11	25 (53.1%)
Female	19	03	22 (46.9%)
Total	33	14	47 (100%)

Table 5: Brought dead or died in hospital

Hospitalized/Brought dead	Cases	Percentage
Hospitalized	47	100
Brought dead	00	00

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Total	47	100

Table 6: Survival Period

Survival Period	Cases	Percentage
< 12 hrs	03	6.3
12-24 hrs	03	6.3
1-2 days	04	8.6
3-4 days	02	4.3
5-6 days	17	36.1
7-8 days	09	19.2
9-10 days	04	8.6
>10 days	05	10.6
Total	47	100

Table 7: Total Body surface involved

Total body surface area (%)	Cases	Percentage
10 - 20 %	01	2.1
20 - 30 %	03	6.4
30 - 40 %	04	8.6
40 - 50 %	09	19.1
50 - 60 %	09	19.1
60 - 70 %	11	23.4
70 - 80 %	0	0
80 - 90 %	06	12.8
90 - 100 %	04	8.5
Total	47	100

Table 8: Cause of Death

Cause of death	Cases	Percentage
Burn Shock	08	17.1
Toxaemia	04	8.5
Septicemia	35	74.4
Total	47	100

Table 9: Manner of Death

Manner	Cases	Percentage
Suicidal	05	10.6
Accidental	42	89.4
Homicidal	00	00
Total	47	100

Table 10: Monthly Distribution

Month	Cases	Percentage
January	07	14.8
February	07	14.8
March	02	4.2
April	04	8.5
May	04	8.5
June	01	2.2
July	04	8.5
August	01	2.2
September	01	2.2
October	03	6.3
November	08	17.2
December	05	10.6
Total	47	100

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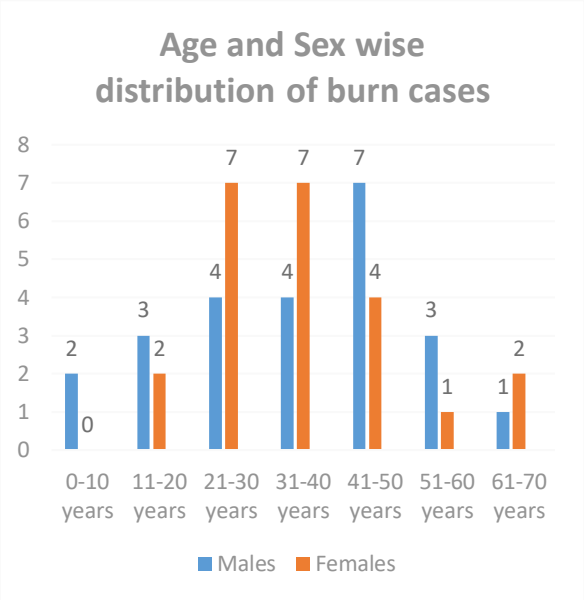
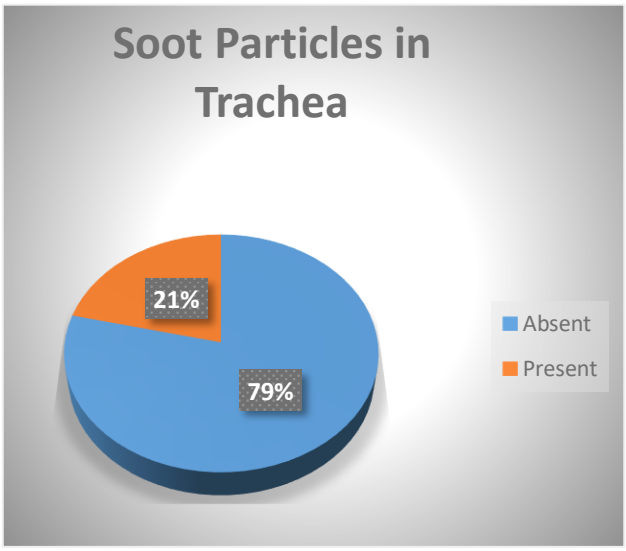
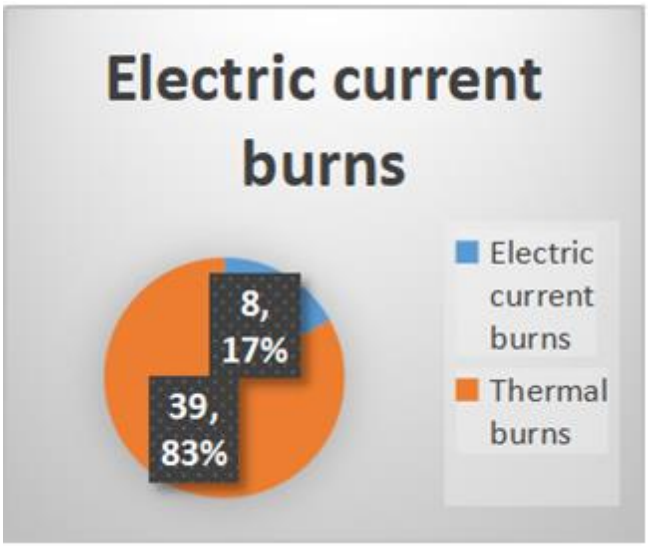


Graph 1: Age and Sex wise distribution of burn cases



Graph 2: Percentage of Soot particles in Trachea



Graph 3: Percentage of Electric burns

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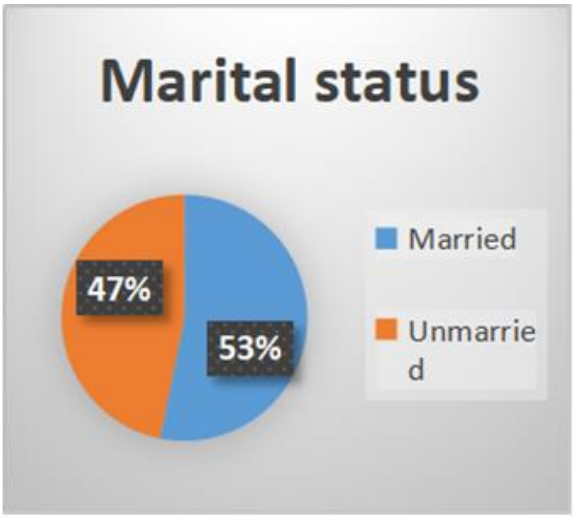

Graph 4: Marital status

DISCUSSION

In the present study, there is slight male preponderance, 51.1 and 48.9 in males and females respectively which is similar to study done by Memchoubi PH and Nabachandra H[7] and differs from study done by Mishra PK et al[3], Pateria D et al[1] and Bhagora RV et al[4], where there is female predominance. The age group 21-40 years is the young adult group and usually the age for marriage in this area of study. The reason for the Sikh victim predominance is that in this part of the world Sikhism is the most commonly followed religion which differs from study done by Mishra PK et al[3].

Majority of cases were married (70.2 %) and 29.8 % were unmarried and among the married, 40.4 % were females. This female dominance, is probably due to the fact that they are mostly involved in cooking, especially after marriage. This finding is similar to the study done by Mishra PK et al[3] and Pateria D et al[1] . Soot particles were found in trachea in 21 % of cases, which is similar to the findings of K.C. Das[5], who found soot particles in trachea in 18.05% cases and D. Nath[6] who found in 34.07% cases and Mazumder A and Patowary A[7], who found soot particles in trachea in 19% cases and is in contrast with study done by Mishra PK et al[3].

All of the victims (100%) died in the hospital after receiving treatment, which include intravenous fluid and also some oral medication. This might be the cause for absence of soot particles in the trachea in most of the victims. This finding is similar to study done by Mishra PK et al[3] and is in contrast with the finding of the study done by Memchoubi PH and Nabachandra H[8]. In the present study, the majority (83%) of the victims had more than 40% of total body surface area (TBSA) burn indicating the incompatibility with life even at a tertiary care center. These finding were similar to the study done by Mishra PK at al[3] and Mazumder A and Patowary A[7]. Septicemia was found to be the most common cause of death in most of the victims (74.4%), which is similar to study done by Sharma A et al[9] , Harish D and Kumar A[10] . Majority of the cases (70 %) succumbed to death within week. Similar findings were noted in studies done by Memchoubi PH and Nabachandra H[8] (73 %) , 60.8 % cases died within a week in studies done by Ragheb et al[11] , indicating that burns are rapidly fatal. Majority of the cases had accidental burns (89.4%), followed by suicidal (10.6%) which is nearly similar to the findings in the study done by Pateria D et al[1] and Bhagora RV et al[4] , K.C. Das[5], Chaudhary BL et al[12] and Manigandaraj G et al[13] in 2023, and is in contrast with the findings of study done by Memchoubi PH and Nabachandra H[8] . No deaths were allegedly homicidal in nature in our study. Most of the cases (61%) occurred between November to march which is similar to study done by Memchoubi PH and Nabachandra H[8].

CONCLUSION

The epidemiological factors for injuries due to burns varies from one part of the country to another as it depends on various local factors. Mass education and following safety instructions like wearing tight and cotton cloths while cooking, switching off the lights while going out, not leaving any fire source unattended etc will surely reduce the incidence of burn injuries. Government organisations, social groups and Non-Government organisations need to put more effort in raising the awareness of public at large. Proper steps should be taken to reduce mortality due to burns and to decrease their incidence in cases especially where human errors plays a role. Also due to modernization, use of Induction cooking appliances and non inflammable stoves will definitely help in minimizing mortality and morbidity due to burns.

Conflict of Interest: There is no conflict of interest.

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