

Study of profile of fatal burn cases at a tertiary care center of Haryana

S.S Dalal^{1*}, S.K Dhatarwal², Sandeep Kumar Giri³

¹Associate Professor, ²Sr. Professor & Head, ³Post Graduate, Dept. of Forensic Medicine, ¹N.C. Medical College, Israna, Panipat, Haryana, ^{2,3}Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences Rohtak, Haryana, India

***Corresponding Author:**

Email: satyavirdalal@hotmail.com

Abstract

Among the various types of the trauma, injuries due to burns the fourth most common type of trauma worldwide, following road traffic accidents; falls and interpersonal violence. Injuries due to burns are a major social, economic and public-health problem due to their mortality, morbidity and long term disability. This study was carried out at a tertiary care hospital of Haryana to assess the pattern of burn deaths over 50 cases of burns brought for the post-mortem examination. In this study, the majority of burn deaths were observed in the age group of 2-30 years age group (34%), followed by 31-40 years age group (24%). Female preponderance was seen with male to female ratio 1:1.4. Most of the cases were from rural area (64%). In both sexes, majority of the victims were married (74%). Maximum 54% cases showed total body surface area involvement between 75 - 100% and most of the cases (42%) survived for 3-7 days. Accidental burns accounted for 84% cases. Burns are preventable. Prevention strategies should address the hazards for specific burn injuries, education for vulnerable populations and training of communities in first aid.

Keywords: Burns, Mortality, Morbidity, Post-mortem examination.

Introduction

Burn injuries have been a major cause of concern since prehistoric days to the present era of modern medicine.⁽¹⁾ Burn is an injury caused by heat, or by a chemical or physical agent having an effect similar to heat.⁽²⁾ The extent of damage when external heat is applied depends upon the applied temperature, ability of the body surface to conduct away the excess heat and time for which the heat is applied.⁽³⁾ The minimum temperature for producing burn is about 44°C for an exposure of about 5 to 6 hours. At 65°C, two seconds are sufficient to produce burns and full thickness destruction of skin occurs within seconds above 70°C.⁽⁴⁾ Burns are a global public health problem, accounting for an estimated 1,80,000 deaths annually. In 2004, nearly 11 million people worldwide were burned severely enough to require medical attention. The majority of these occur in low and middle income countries. In India, over 1,000,000 people are moderately or severely burnt every year. Burns occur mainly in the home and workplace. Children and women are usually burned in domestic kitchens, from upset receptacles containing hot liquids or flames, or from cookstove explosions. Men are most likely to be burned in the workplace due to fire, scalds, chemical and electrical burns.⁽⁵⁾

The aim of the present study was to observe the profile and to study the various medico-legal aspects of fatal thermal burn cases.

Materials and Methods

The study was conducted over 50 burn cases, brought for post-mortem examination to the mortuary of Department of Forensic Medicine, Pt. B. D. Sharma PGIMS, Rohtak. The details of the all 50 cases namely age, sex, marital status, survival period after sustaining the burn, percentage of burn, and manner of death were collected from the relatives, accompanying police official, hospital record of the deceased and post-mortem examination in the proforma prepared. All antemortem burn cases were included in this study. Unknown cases, charred bodies and post-mortem burns were not included in the study.

Observations and Results

The information namely: age, sex, marital status, survival period after sustaining the burn, percentage of burn, and manner of death of all 50 cases were compiled, tabulated, analyzed statistically. Following results were obtained:

Table 1: Gender wise distribution of fatal burn cases

Gender	No. of fatal burn cases	Percentage
Male	21	42
Female	29	58
Total	50	100

As per the table no. 1, males accounted for 21 (42%) victims, while females numbered 29 (58%), the overall male: female ratio being 1:1.4.

Table 2: Age & Sex wise distribution of fatal burn cases

Age group (in years)	Male		Female		Total	
	No.	%	No.	%	No.	%
<10 years	1	2	0	0	1	2
10 – 20	1	2	6	12	7	14

21 – 30	4	8	13	26	17	34
31 – 40	6	12	6	12	12	24
41 – 50	8	16	2	4	10	20
51 – 60	0	0	1	2	1	2
61 – 70	0	0	1	2	1	2
71 – 80	1	2	0	0	1	2
Total	21	42	29	58	50	100

Maximum cases of burns were seen in the 21- 30 years age group (17 cases, 34%), followed by 31- 40 years age group (12 cases, 24%). Among females, most of the cases of burns were seen in 21 - 30 years age group (13 cases, 26%) whereas in males, most of the cases observed in age group 41 - 50 years (8 cases, 16%).

Table 3: Marital status wise distribution of fatal burn cases

Marital status	Male		Female	
	No.	Percentage	No.	Percentage
Married	17	34	20	40
Unmarried	4	8	9	18

Table 3 shows that most of the victims 74% were married and 26% were unmarried with married-unmarried ratio of 2.8:1.

Table 4: Area wise distribution of fatal burn cases

Area	No. of fatal burn cases	Percentage
Rural	32	64
Urban	18	36

As per the table no. 4, most of the victims belongs to the rural area (32 cases, 64%) and rest were urban area (18 cases, 36%).

Table 5: Total Body Surface Area Burn wise distribution of fatal burn cases

Total Body Surface Area Burn (in%)	No. of fatal burn cases	Percentage
35 – 50	11	22
50 – 75	12	24
75 – 100	27	54

Maximum 23 (46%) cases showed total body surface area involvement of burn between 35–70%, followed by 17 cases (34%) >90%.

Table 6: Survival period wise distribution of fatal burn cases

Survival period	No. of fatal burn cases	Percentage
Brought dead	1	2
< 24 hours	11	22
24 – 72 hours	8	16
3 – 7 days	21	42
>7 days	9	18

It was observed that majority of the victims were hospitalized (49 cases). Among them, 21 victims died between 3 to 7 days, 11 died within 24 hours and 9 died after 7 days.

Table 7: Manner wise distribution of fatal burn cases

Manner	No. of fatal burn cases	Percentage
Accidental	42	84
Suicidal	8	16

Most of the cases were accidental 42 cases (84%) followed by suicidal cases 8 (16%). There was no case of homicide.

Discussion

- In the present study predominance of female cases is observed and most of them were in the age group 21-30 years which is very similar to the observed age group of other studies.⁽⁴⁻⁹⁾ In contrast, Memchoubi, et al⁽¹⁰⁾ reported slight male preponderance in their study. As for the female predominance, females are mostly involved in cooking and the most common cause of fire in the accidental bursts of cookstove.
- The present study revealed that majority of the victims were married in both the genders which showed very similar observation of other studies.^(7,9)
- In our study maximum number of victims were from rural area (64%) than from urban area (36%) similar to the observations of the Ghaffar et al.⁽¹⁷⁾
- In most of the cases total body surface area burn sustained 75 to 100%, similar to the observations by Buchade D,⁽⁵⁾ Mazumdar A,⁽⁹⁾ Bhore DV⁽¹¹⁾ and Zanjad P.⁽¹²⁾
- Most of the victims survived for 3-7 days and died due to septicaemia. Similar results were observed by Buchade D⁽⁵⁾ and Bhore DV.⁽¹¹⁾ In contrast, 60.8 % of cases in Kumar V,⁽¹³⁾ 59% in Mishra PK⁽⁴⁾ and 58% in Ragheb SA⁽¹⁴⁾ studies died within a week. Most of the burn victims succumb to the infections and their complications, if they survive for >72 hours. The burn injury causes devitalisation of the affected surface and produces extensive raw areas, which become moist due to the exudation of plasma, forming a medium ideal for the colonization and proliferation of various types of micro-organisms. The affected

individual's immune system is depressed and dysfunctional, and this, compounded by the large cutaneous bacterial load, the possibility of gastrointestinal translocation, prolonged hospitalization and associated invasive diagnostic and therapeutic procedures, all contribute to sepsis.⁽¹⁶⁾

- f. In this study most of injuries are accidental in nature. Similar results were noted by others.^(5,9,11,12,15) It is very difficult to opine that a burn injury is accidental or suicidal or homicidal in nature. However, accidental burns were more common as compared to suicidal & homicidal burns proved by many studies.

Conclusion

Burns are preventable. Prevention strategies should address the hazards for specific burn injuries, education for vulnerable populations and training of communities in first aid. An effective burn prevention plan should be multisectoral and include broad efforts to:

- Improve awareness
- Develop and enforce effective policy
- Describe burden and identify risk factors
- Set research priorities with promotion of promising interventions
- Provide burn prevention programmes
- Strengthen burn care
- Strengthen capacities to carry out all of the above.

Conflict of interest: None

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