

# Medico-social aspects of burn injuries

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## ABSTRACT

**Background:** Globally approximately 2.5 lakh deaths occur every year, with majority of cases from low and middle socioeconomic strata. The epidemiological characteristics of burn may vary widely throughout the world. This study has been aimed to study medico social aspect of burn patients to evaluate mode of injury and preventive measures to decrease incidence. **Materials and Methods:** This is a retrospective study with patient's data from January 1, 2016 to December 31, 2016. We enrolled 436 case of burn admitted to the Department of Surgery Ganesh, Shankar Vidyarthi Memorial Medical College, Kanpur and Associated Lala Lajpat Rai Hospital, Kanpur. **Results:** In our study, we enrolled 436 cases out of which females were 66.8% and remaining were of male 33.2%. Majority of patients were in the age group of 21–30 years age followed by 31–40 years age group. Burn mostly affect unemployed married female with low socioeconomic strata. In present study, thermal burn was the most common (83%). More than three fourth of burn cases were accidental in nature followed by suicidal. **Conclusion:** Even in the era of technological advancement burn still remain a major issue of concern in most developing countries including India, it predominantly involve the population from productive age group especially female and mainly accidental in nature.

**Key words:** Burn, accidental, total body surface area, injury

## INTRODUCTION

Fire was discovered accidentally by Mankind around 40,000 years ago. It is an ancient belief that fire is one of the five essential elements of life along Prithvi (Earth), Jal (Water), Akash (Sky), and Vaayu (Air).<sup>[1]</sup> The use of fire not only benefited man but also harmed him by causing minor to severe injuries and even California death. Burn is defined as an insult or trauma to body tissues resulting from thermal heat, chemical, electric, sunlight, and radiation.<sup>[3]</sup>

Burn injuries represent an extremely stressful experience for both the burn victim as well as their families. Patient with extensive burn frequently die and for those with lesser injury physical recovery is slow and painful. The most common type is scald burns occurring due to hot liquids steam, gases, and inflammable liquids. Inhalational burns are caused due to inhalation of smoke. Burn may be accidental or otherwise non-accidental burn may be due to deliberate self-immolation (attempt suicide) or due to assault (attempt homicide).<sup>[2]</sup> Burn is the 4<sup>th</sup> most common type of trauma worldwide following road traffic accident, fall, and violence among people. Almost 95% of Global burn death and disabilities are estimated to occur in low- and middle-income countries of the world. They destroy the psyche and physique of the injured individual permanently.

In India burn injury is one of the major cause of death in female as a result of sociocultural factors present in the country, some of

these factors may be due to poor housing conditions, inadequate maintenance of electrical appliance, ethnicity of wearing saree or dupatta, dowry, poor literacy, poverty, and ignorance. This leads to significant increase of burn case. This study was conducted to identify medico social aspect of burn patient to investigate the factor affecting outcome and mortality of burn and to determine the magnitude of problem of burn among all injuries admitted to Department of Surgery GSVM medical college and associated LLR Hospital, Kanpur over a period of one year.

## MATERIAL AND METHODS

This study was conducted retrospectively on 436 case of burn-in period of 1 year from January 2016 to December 2016 admitted to Burn Unit, Department of Surgery Ganesh, Shankar Vidyarthi Memorial Medical College and associated Lala Lajpat Rai Hospital Kanpur. Initial assessment and diagnosis of burn injury was made by a thorough history, physical examination and supportive investigation. The total body surface area (TBSA) of burn was calculated by employing rule of nine. All patients were admitted for indoor management. Data collection was performed with the help of comprehensively designed pro forma that encompassed a relevant epidemiological and clinical variable of interest. The sociodemographic profile of all patients (age, sex, marital status, employment status, rural vs. urban origin, cause of burn, and TBSA), all were recorded on pro forma. These patients were managed according to standard management protocol of burn injury.

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## RESULTS

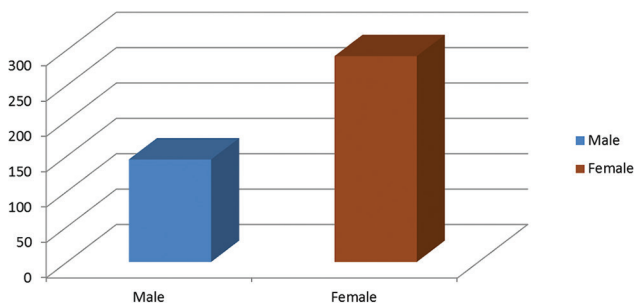
We have analyzed the various data available to us and results are shown as below.

## DISCUSSION

The developing world accounts for a vast majority (approximate 90% burn occurring around the globe) due to lack of education, overcrowding, and unsafe cooking habits. Southeast Asia account

**Table 1: Distribution of burn cases according to sex**

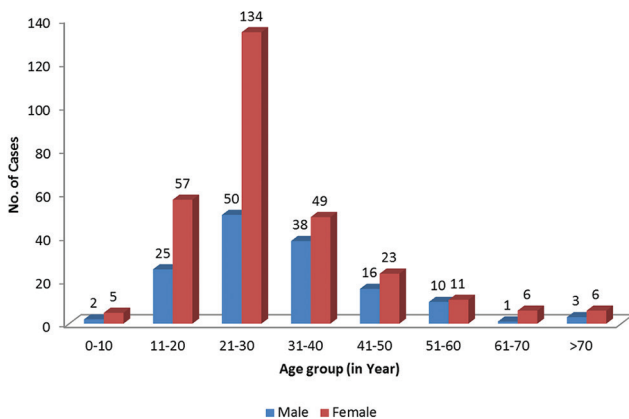
Sex	Number of cases (%)
Male	145 (33.2)
Female	291 (66.8)



Distribution of burn cases according to sex

**Table 2: Distribution of burn patients according to age wise**

Age group (in years)	Male	Female
0-10	2	5
11-20	25	57
21-30	50	134
31-40	38	49
41-50	16	23
51-60	10	11
61-70	1	6
>70	3	6



Distribution of Burn patients according to age

for roughly 60% of fatal burn cases around the world with a rate of 11.6 per 1 lakh compared to 1990 the number of fatal burn cases has increased from 2,80,000 to 3,38,000 in 2010.<sup>[4]</sup> The lower socioeconomic strata is most commonly affected by burn injuries. In India number of people suffering from burn injuries per year is approximately 7,00,000-8,00,000 with highest incidence in women of age group 16-45 years.

The maximum number of patients in our study belong to working age group 16-40 years (Table 2) which is similar to other studies in southeast Asia.<sup>[5-9]</sup> The higher incidence in this group explained by the fact that they are the most active group and exposed to hazardous environment at home and work. Out of 436 patients 66.8% are female and remaining 0f 33.2% are male (Table 1). These findings are similar to other studies.<sup>[9-12]</sup> The higher incidence of burn-in female in our

**Table 3: Distribution of cases according to socioeconomic status**

Socioeconomic status	Male (%)	Female (%)
Urban	82 (19)	120 (28)
Rural	63 (14)	171 (39)

**Table 4: Distribution of cases according to marital status**

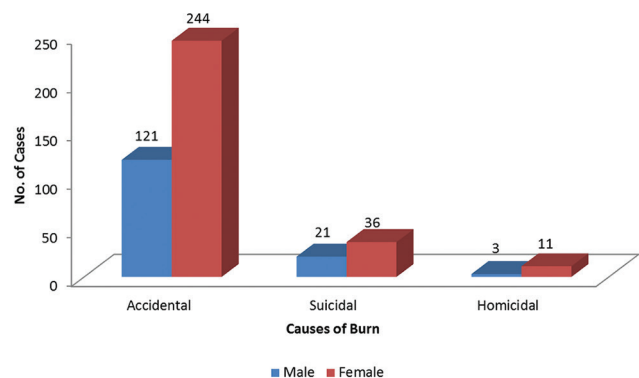
Marital status	Male (%)	Female (%)
Married	118 (28)	229 (52.5)
Unmarried	27 (5.3)	62 (14.2)

**Table 5: Distribution of cases according to occupation**

Occupation	Male (%)	Female (%)
Unemployed	94 (64)	212 (73)
Employed	51 (36)	79 (27)

**Table 6: Distribution of cases according to causes of burn**

Causes of burn	Male (%)	Female (%)
Accidental	121 (28)	244 (56)
Suicidal	21 (4.8)	36 (8.2)
Homicidal	3 (0.50)	11 (2.5)



Distribution of cases according to causes of burn

study is mostly cause by thermal burn as in Indian culture female are mostly responsible for housework involving cooking.

In our study, most common type is thermal burn 362 cases (83%) which is similar to other studies (Table 7).<sup>[5-9,13]</sup> Burn was mainly affect low socioeconomic strata people that is 234 cases in rural population while in urban population it is 202 case in our study (Table 3).

In present study, majority of burn cases (45%) having TBSA affected around 40–70% (Table 8). These patients were using kerosene oil while cooking and wearing clothing made of nylon and cotton fabric which easily catches fire. The other studies showed that 54.6% patient sustained <15% TBSA and 14.1% patients sustained more than 40% TBSA burn (Table 9).<sup>[14-16]</sup> The majority of burn injuries in our study occurred at home with kitchen being most common location these findings correspond to other studies around the world.<sup>[15,17,18]</sup> These findings suggest that major precaution should be taken especially in kitchen to reduce the incidence of burn injury Table 4-6 and Figure 1-4 shows various cases of burns.

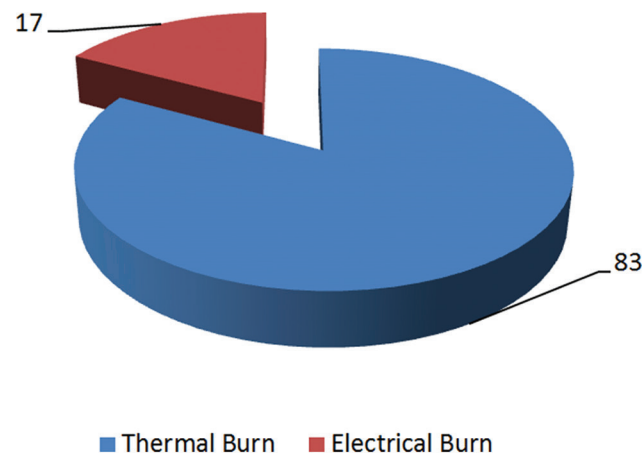
**CONCLUSION**

Burn is preventable public health problem, we believe most of burn injuries in India are caused due to illiteracy, ignorance and

lack of effective health education policy and awareness program in rural India. This study shows that women mostly living in rural areas are at high risk with burn associated mortality and morbidity. We recommend for a topic on burn injuries, its prevention as well as first aid to be included in syllabus at mid-level of education in developing countries.

**Table 7: Distribution of cases according to type of burn**

Type	Number of cases (%)
Thermal burn	362 (83)
Electrical burn	74 (17)

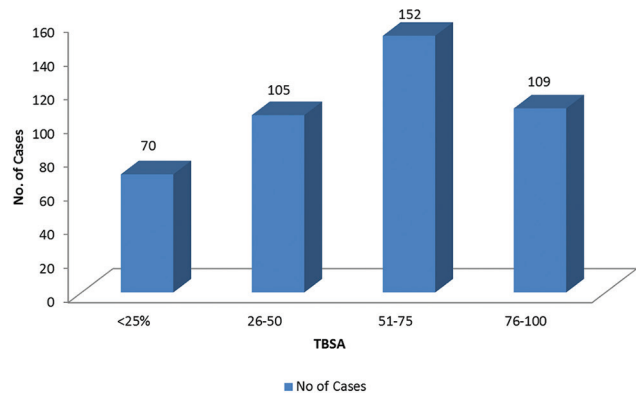


**Distribution of cases according to Type of burn**

**Table 8: Distribution of burn cases according to TBSA by rule of nine**

TBSA	Number of cases (%)
<25%	70 (16)
26–50	105 (24)
51–75	152 (35)
76–100	109 (25)

TBSA: Total body surface area



**Distribution of burn cases according to total body surface area by rule of nine**



**Figure 1:** (a and b): Showing 45% TBSA flame burns

**Table 9: Distribution according to source of flame burn (excluding another mode)**

Source of flame burns	Male (121 case %)	Female (241 cases %)	Total (362 cases %)
Kerosene stove	22 (18.1)	52 (21.5)	74 (20.4)
Kerosene lamp	5 (4.1)	34 (14.1)	39 (10.7)
Chullah	14 (11.5)	56 (23.2)	70 (19.3)
Fire work	46 (38)	25 (10.3)	71 (19.4)
LPG	10 (8.2)	38 (15.7)	48 (13.2)
Kerosene can	18 (15.1)	16 (6.6)	34 (9.4)
Lamp (Diya)	6 (5)	20 (8.6)	26 (7.6)





**Figure 2:** (a and b) showing electric burn injury



**Figure 3:** Showing 15%TBSA flame burn injury



**Figure 4:** Showing 95%TBSA thermal burn injury

## REFERENCES

- Vaghela PC, Ahir GN, Patel MH. Epidemiology of fatal burns cases in G.K. general hospital, Bhuj. *Natl J Community Med* 2012;3:320-9.
- Silverstein P, Lack BO. *Epidemiology and prevention. The Art and Science of Burn Care.* Rockville, Md: Aspen Publishing; 1987. p. 11-9.
- Daruwalla N, Belur J, Kumar M, Tiwari V, Sarabahi S, Tilley N, *et al.* A qualitative study of the background and in-hospital medicolegal response to female burn injuries in India. *BMC Womens Health* 2014;14:142.
- Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, *et al.* Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: A systematic analysis for the global burden of disease study 2010. *Lancet* 2012;380:2095-128.
- Sharma NP, Duke JM, Lama BB, Thapa B, Dahal P, Bariya ND, *et al.* Descriptive epidemiology of unintentional burn injuries admitted to a tertiary-level government hospital in Nepal: Gender-specific patterns. *Asia Pac J Public Health* 2015;27:551-60.
- Chalise PR, Shrestha S, Sherpa K, Nepal U, Bhattachan CL, Bhattacharya SK. Epidemiological and bacteriological profile of burn patients at Nepal medical college teaching hospital. *Nepal Med Coll J* 2008;10:233-7.
- Gupta AK, Uppal S, Garg R, Gupta A, Pal R. A clinico-epidemiologic study of 892 patients with burn injuries at a tertiary care hospital in Punjab, India. *J Emerg Trauma Shock* 2011;4:7-11.
- Shanmugakrishnan RR, Narayanan V, Thirumalaikolundusubramanian P. Epidemiology of burns in a teaching hospital in south India. *Indian J Plast Surg* 2008;41:34-7.
- Ganesamoni S, Kate V, Sadasivan J. Epidemiology of hospitalized burn patients in a tertiary care hospital in South India. *Burns* 2010;36:422-9.
- Khan AA, Rawlins J, Shenton AF, Sharpe DT. The Bradford burn study: The epidemiology of burns presenting to an inner city emergency department. *Emerg Med J* 2007;24:564-6.
- Mzezewa S, Jonsson K, Aberg M, Salemark L. A prospective study on the epidemiology of burns in patients admitted to the Harare burn units. *Burns* 1999;25:499-504.
- Basu H, Biswas S, Chatterjee C, Mondal R, Sarkar PK, Sarkar K. Clinico epidemiological study on burn victims: What is the current picture in a tertiary care hospital of India? *Natl J Commun Med* 2014;5:311-5.
- Liu EH, Khatri B, Shakya YM, Richard BM. A 3 year prospective audit of burns patients treated at the Western regional hospital of Nepal. *Burns* 1998;24:129-33.
- Lari AR, Alaghebandan R, Nikui R. Epidemiological study of 3341 burns patients during three years in Tehran, Iran. *Burns* 2000;26:49-53.
- Panjeshahin MR, Lari AR, Talei A, Shamsnia J, Alaghebandan R. Epidemiology and mortality of burns in the South West of Iran. *Burns* 2001;27:219-26.
- Groohi B, Alaghebandan R, Lari AR. Analysis of 1089 burn patients in province of Kurdistan, Iran. *Burns* 2002;28:569-74.
- den Hertog PC, Blankendaal FA, ten Hag SM. Burn injuries in the Netherlands. *Accid Anal Prev* 2000;32:355-64.
- Fernandez-Morales E, Galvez-Alcaraz L, Fernandez-Crehuet-Navajas J, GomezGracia E, Salinas-Martinez JM. Epidemiology of burns in Malaga. Spain *Burns* 1997;23:323-32.

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