

## EPIDEMIOLOGY OF FATAL BURN CASES IN G.K. GENERAL HOSPITAL, BHUJ

Vaghela Prithvirajsinh C<sup>1</sup>, Ahir Ghanshyam N<sup>2</sup>, Patel Malay H<sup>3</sup>

<sup>1</sup>Assistant professor, Forensic Medicine Department, <sup>2</sup>Assistant professor, Community Medicine Department, <sup>3</sup>Tutor, Forensic Medicine Department, Gujarat Adani Institute of Medical Sciences, Bhuj

### ABSTRACT

**Background:** Burn injury cases are one of the common emergencies admitted to any hospital in India. There are several factors, which play a great role in the treatment, management, autopsy and investigations of burns death cases.

**Objective:** The study was aimed to find the epidemiology, pattern of burns deaths and various reasons or factors associated with it.

**Methodology:** The present cross-sectional study of 1504 cases was carried out in Forensic Medicine Department at Gujarat Adani Institute of Medical Sciences, Bhuj from January 2008 to December 2011.

**Results:** The most common cause of death in the majority of the deaths was burns (31.12%) followed by head injury (21.61%), poisoning (11.44%), regional injury (9.37%), drowning (5.12%) and hanging (5.05%). Maximum incidence (82.26%) seen in females. Most of the victims (42.09%) were in the age group of 21-30 years. Most burns were domestic, in low socio-economic class and in house-wives. 74.57% of cases were accidental in nature as per reports.

**Conclusion:** Most of the causes are preventable. The result of this study indicates that, by not only a strong legal support network but also safety precautions, opportunities for essential education and awareness, alternative accommodation and a change in attitude and mind set of society, judiciary, legislature, executive, men and the most importantly women herself can lower or prevent such deaths.

**Keywords:** Burn case, fatal, epidemiology, unnatural death

### INTRODUCTION

Fire has been known to mankind for about 400,000 years. Most of the communities believe that the whole universe is made up of five essential elements: Water (*Jal*), Air (*Vayu*), Earth (*Prithvi*), Sky (*Aakash*) and Fire (*Agni*). So, this way fire or burns have great importance in our life.<sup>1</sup>

Burns constitute a major role in mortality and morbidity in the whole world, whether accidental, suicidal or homicidal. Burn injuries are among the most devastating of all injuries and a major global public health crisis. Burns are the fourth most common type of trauma worldwide, following traffic accidents, falls, and interpersonal violence. Approximately 90 percent of burns occur in low to middle income countries, regions that generally lack the

necessary infrastructure to reduce the incidence and severity of burns.

In India, burns injury is one of the major causes of death, specifically in females. The problem of burns in developing countries like India is more due to various socio-cultural factors present in the country. Some of these factors may be poor housing conditions, poor maintenance of electric appliances, customs of wearing *sarees* or *dupatta*, dowry, illiteracy, ignorance and poverty. The exact estimation of burns incidence is very much difficult due to large population and lack of reporting. The loads of over population, illiteracy, low socio-economic status, poor standards of safety at home and at industry, corruption etc has caused a significant rise in burns cases.<sup>2</sup>

A 'burning' topic in India is the burn deaths of young females. Such a way of ending life is

peculiarly common in our country. Many young newly married females die from burn injuries, the most common reasons given in post-mortem reports therefore being that she caught a light (a) while cooking; (b) after an oil explosion in a stove; or (c) when a chimney fell on her at night. These are the usual explanations given in post-mortem requisition documents furnished by the police, but on enquiry from relatives and neighbors many were found not to be true.<sup>3</sup>

The aims and objective of this research work is to study the epidemiology of burns in this region of the country and find out certain reasons and causes particular to our social set up with special emphasis on preventive aspects of the burns.<sup>4</sup>

**MATERIAL AND METHODS**

The cross-sectional study was carried out during the period of January 2008 to December 2011 in Forensic Medicine Department at Gujarat Adani Institute of Medical Sciences, Bhuj. The study included 1504 medico legal post mortems performed in G.K. General Hospital, Bhuj. The cases included not only Bhuj city but also from surrounding areas of Bhuj district. Out of total 1504 cases, 1353 cases were of unnatural deaths. Out of these 1353 cases, 468 cases of burns were taken for this detailed study. The information regarding cause of death, age, sex, socio economic status, area wise distribution and other details were taken from medical record section, New G.K. General Hospital, Bhuj and

concerned investigating authorities. All the data thus collected by preparing pre-tested structured proforma and were analysed systemically with the use of Graphpad software. The study has been approved by Institutional Ethical Committee.

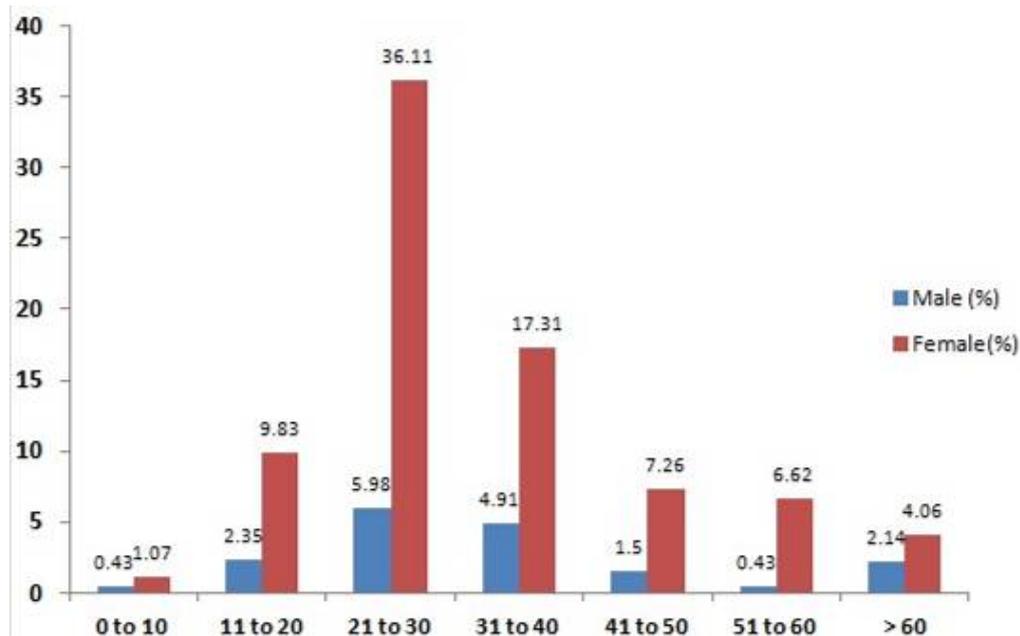
**OBSERVATION**

The present study comprised of 468 autopsy cases of burns out of total 1504 autopsies during the period of January 2008 to December 2011. (Table 1)

**Table 1: Total unnatural deaths and Burns deaths**

Year	Burns Cases (%)	Other Unnatural Deaths Cases (%)	Total Unnatural Deaths Cases (%)
2008	123 (37.05)	209 (62.95)	332 (100)
2009	123 (35.45)	224 (64.55)	347 (100)
2010	114 (35.29)	209 (64.71)	323 (100)
2011	108 (30.77)	243 (69.23)	351 (100)
<b>Total</b>	<b>468 (34.59)</b>	<b>885 (65.41)</b>	<b>1353 (100)</b>

The annual incidence was 34.64% and the highest was in the year 2009. Among all 1504 cases, burns were the commonest unnatural death (31.12%), followed by head injury (21.61%), poisoning (11.44%), regional injury (9.37%), drowning (5.12%) and hanging (5.05%). (Figure 1)



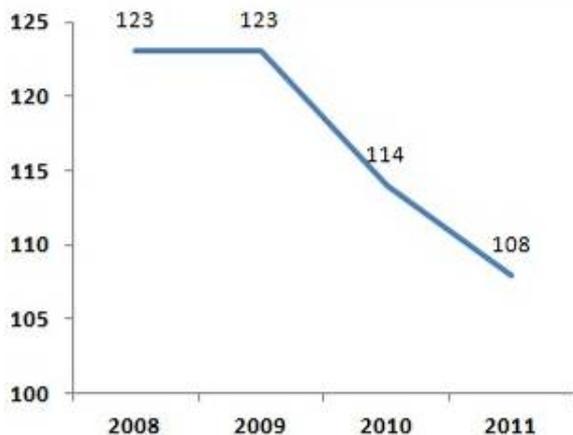
**Figure 1: Gender and age group wise proportion of burn deaths**

Majority of cases (42.09%) were in the age group between 21 to 30 years in both sexes. and minimum cases (1.50%) were seen in the age group of 0 to 10 years. Among 468 cases of burns, 82.26% were females and 17.74% were males. (Figure 2) Most of victims were married (74.79%). Among all female deaths, most of them were married (66.24%). (Table 2)

**Table 2: Distribution of Burns cases according to Sex, Marital Status, Area, Place of burns and Socio-economic status**

Variables	Male (%)	Female	Total
<b>Marital Status</b>			
Married	40 (8.55)	310 (66.24)	350 (74.79)
Unmarried	43 (9.19)	75 (16.02)	118 (25.21)
<b>Area</b>			
Rural	42 (8.97)	287 (61.32)	329 (70.30)
Urban	41 (8.76)	98 (20.94)	139 (29.70)
<b>Place</b>			
Home	17 (3.64)	356 (76.06)	373 (79.70)
Outside	66 (14.10)	29 (6.20)	95 (20.30)
<b>Socio-economic status</b>			
Upper	34 (7.27)	14 (2.98)	48 (10.26)
Middle	21 (4.49)	181 (38.68)	202 (43.16)
Lower	28 (5.98)	190 (40.60)	218 (46.58)

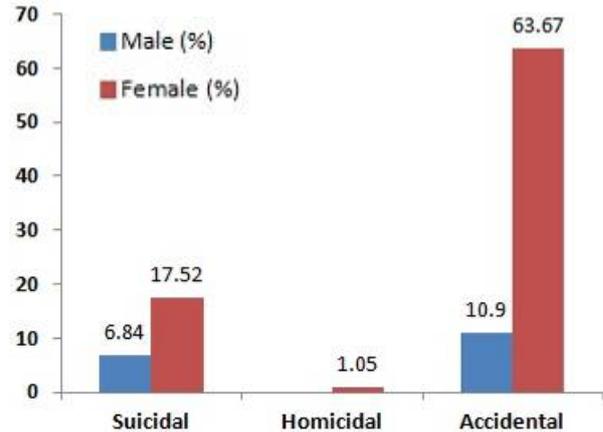
Rural victims (70.30%) outnumbered urban victims (29.70%). (Table 2) Majority of burns took place at home (79.70%) and 20.30% outside the home. (Table 2) This incidence was very much more in females (92.46%) compare to males (20.48%).



**Figure 2: Year wise Burn Death**

Most of the cases (74.57%) were accidental in nature followed by suicidal (24.36%) and

homicidal (1.07%). Among all female deaths, the most common manner was accident (77.40%) compare to suicide (21.30%) and homicide (1.30%). (Figure 3) According to modified Prasad's classification, 46.58% cases were from lower class, 43.16% cases from middle class and 10.26% from upper class. (Table 2)



**Figure 3: Gender wise type of burn deaths**

## DISCUSSION

Burn injuries have been a major cause of concern since pre-historic days to the present era of modern medicine. However, the general belief that burns usually occurs at the two extreme of age, indicating the accidental nature of infliction does not hold true in the present Indian set-up where the majority of the reported cases belongs to third decade of life. Despite of the modernization, the domestic fire is the major cause of the burns with maximum involvement of females and the accidental injury the main cause.

In the present study, there is a predominance of female victims (82.26%) than males (17.74%) in burns cases and majority of them where were in the reproductive and productive age groups (21-30 years, 42.09%).

The most common manner of burns was accidental (74.57%) followed by the suicidal (24.36%) and homicidal types (1.07%) as per reports, but these data may not be factual due to under reporting. In India, many deaths are not registered as suicide due to dear of social and legal consequences associated with the same (IPC 306 and IPC 309). Similarly, in an earlier study, Chawla et al <sup>1</sup> had observed 64% cases belonging to females and 52% cases were in the

age group of 21-30 years. These observations are confirmatory with other studies from various regions of India.<sup>5, 6, 7, and 8</sup> This may be due to gender difference, socio-cultural factors and dowry problems. Secondly most of the women are house wives and they come more in contact with fire.<sup>2</sup> Memchoubi Ph. and H. Nabachandra<sup>5</sup> also mentioned that majority of victims were died accidentally, which is supported by other studies also.<sup>9</sup>

Rural victims (70.30%) outnumbered urban victims (29.70%). The present study findings similar to the findings of Haralkar S J et al<sup>2</sup>, L. M. Bariar et al.<sup>10</sup> and others also.<sup>11, 12</sup> this may be due to standard of living and low socio-economic status. Use of *Shagadi*, *Chulha*, and kerosene pressure stove etc. for cooking is more seen in rural areas than in urban areas. In present study, majority of the cases (46.58%) were from lower socio-economic and these findings are comparable with Haralkar S J et al.<sup>2</sup>

In the present study, the higher incidence of unnatural deaths due to burns in the age group of 21 - 30 years in young, newly married females from lower socio-economic class, helps to emphasize the fact that the burn fatalities in India go beyond the meaning implied in the term 'accident' to be aptly termed as a 'Social Calamity'. These deaths in general and homicidal and suicidal burn deaths in particular have genuinely been termed as 'Bride Burning' or 'Dowry Deaths'. The high incidence of burn deaths, especially among the young females is often attributed to cooking on open unguarded flames. Loose, voluminous, highly inflammable, synthetic garments / saris of the victims are alleged to catch fire suddenly while cooking. Kerosene oil, match sticks, and other cooking material, being easily available in houses, is usually preferred by Indian women to commit suicide, and as for killing, it helps to hide not only the torture and other means of violence but also helps to tamper with or even destroy the circumstantial evidence.

The result of this study indicates that, by not only a strong legal support network but also safety precautions, opportunities for essential education and awareness, alternative accommodation and a change in attitude and mind set of society, judiciary, legislature, executive, men and the most importantly women herself can lower or prevent such deaths.

## CONCLUSION

Preventing burn injury will be a major challenge as its occurrences closely linked to living standards and cultural practices. It is possible to reduce burn mortality and morbidity through combination of measures aimed not only at reducing the likelihood of occurrence of fire, but also by reducing the severity and impact of a burn injury through appropriate trauma care practices. More research through establishment of burn injury registries in designated centres will unfurl specific epidemiological characteristics that can be used to develop specific interventions.

## REFERENCES

1. Chawla Rahul, Chanana Ashok, et al. A two year Burns Fatality Study. J IAFM. 2010; 32(4): 292-97.
2. Haralkar S J, Tapare V S and et al. Study of Socio-Demographic Profile of Burns Cases admitted in Shri Chhatrapati Shivaji Maharaj General Hospital, Solapur. NJCM. 2011; 2(1): 19-23
3. Satpathy D K. Burning brides- A Medico-legal study. Med Law, 1995; 14(7-8): 547-52
4. V. Mago, M.Yaseen, L.M. Bariar. Epidemiology and Mortality of Burns in JNMC Hospital, AMU, Aligarh: A 5 year Study. IJCM, 2004-10; 29(4)
5. Memchoubi Ph., H. Nabachandra. A Study of Burn Deaths in Imphal. JIAFM. 2007; 29(4): 971-73
6. Subrahmanyam M. Epidemiology of Burns in A District Hospital in Western India. Burns. 1996;22: 439-42
7. Murty OP, Paul G. Bride Burning and Burns-Certain Differentiating Aspects Thereof. JFMT. 1995;12 ( 3-4):13-26
8. Ghuliani KK. An Epidemiological Study of Burn Injuries. Indian Journal of Public Health. 1998;32(1): 34
9. Sharma BR, Harish D, Sharma A, Sharma S, Singh H. Accidental Fatal burns in Indian Kitchens: Are they really accidental?. JIAFM. 2006; 28(1):14-17.
10. L. M. Bariar. Review of 400 cases of burns at Aligarh. Burns. 1994; 2(1): 35 - 40.
11. Dalbir Singh et al. Burn mortality in Chandigarh Zone: 25 years autopsy experience form a tertiary care hospital of India. Burns. 1998; 24(2):150 -56.
12. E. Fernandez - Morales et al. Epidemiology of burns in Malaga, Spain. Burns. 1997; 23(4): 323 - 25.

## Correspondence:

Dr. Prithvirajsinh C. Vaghela  
Assistant Professor  
Forensic Medicine Department  
Gujarat Adani Institute of Medical Sciences  
Bhuj-370001 (Gujarat)  
E-mail: drpmit.lion007@gmail.com