



Original communication

Autopsy audit of intentional burns inflicted by self or by others in north India-5 year snapshot

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ABSTRACT

Objective: The incidence of suicide and homicide is on the increase worldwide, including India. One million people die annually due to suicides and homicides alone. Thus this study had been undertaken to find out the material and social causes of burn and to assess the socio-demographic characteristics between suicide and homicide.

Methods: This retrospective study was carried out on 1393 fatal burn cases (2008–2012) who were autopsied at the mortuary of King George's Medical University, Lucknow, India. Data retrieved include: age, sex, type of family, marital status, place of incidence, psychological status and burn size (TBSA). The results were presented in Mean \pm SD and percentages and analyzed with SPSS 16.0.

Results: Out of the total 1369 cases of burns, 536 cases (38.5%) were homicidal deaths in comparison to 857 cases (61.5%) of suicidal deaths. Female predominance was seen in both suicidal and homicidal deaths with peak age 30–39 years in suicides in contrast to 40–49 years in homicides. At younger age ≤ 19 years, the victims of suicide is almost similar to the victims of homicide; but at extremes of ages below 10 years and above 60 years, homicides were relatively more common than suicides. Married victims were predominant in the homicidal group (66.6%). There is no quite difference at the place where burn occurs. Depression and anxiety disorders were the most frequent psychiatric co-morbidities associated with suicidal behaviours. Patients from suicidal group suffered significantly larger burns than from homicidal group.

Conclusion: Hence, this study was planned with a purpose to know the magnitude and the socio-cultural factors of the problem of burns to more clearly understand the dynamics surrounding these deaths, so that a sound prevention programme could be suggested, planned and implemented for reducing the incidence of fatal burns.

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1. Introduction

Injuries are an increasingly recognized public health problem, substantially affecting nearly every population and every geographical zone in the world. Burns have always been considered as one of the most destructive injuries, causing not only morbidity and mortality but also major economic and psychological impacts and long-term somatic sequel as well.^{1,2} Apart from high numbers

of deaths, the pain, suffering and agony of burn survivors are immeasurable. Burn injury is often a catastrophic event in the life of an individual. It may be associated with accidental, suicidal or homicidal causes.

Burns are the fourth most common type of trauma worldwide, following traffic accidents, falls and interpersonal violence.³ Incidence of burns is high in India. According to WHO it is estimated that each year over 300,000 people die from fire related burns. The vast majority (over 95%) of fire-related burns occur in low- and middle-income countries.^{4,5}

The data published by the Government of India, Ministry of Home Affairs, indicates that death by fire contributes to 7–9% of all suicidal deaths.⁶ The reasons for this are multi-fold, such as dowry problems, rigidly defined role of women in the family, interpersonal conflicts in a joint family, overcrowding and use of a small,

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open cooking stove.^{7–9} Burns is also reported as homicidal with intentional intent.

In spite of such importance of burn both from clinical as well as social point of view, there is a dearth of research material on burn in India. Thus this study had been undertaken to find out the material and social causes of burn and to assess the socio-demographic characteristics like age and sex incidence, marital status, place of incidence, % of burn and cause of burns etc.

2. Material and methods

2.1. Methodology

A retrospective study comprised a total of 20,877 autopsies performed on all types of unnatural deaths over a period of five years (2008–2012). Among them, 2225 (10.7%) were the cases of burns as reported earlier.¹⁰ The remaining 1393 cases were fatal burn (homicidal and suicidal) that were autopsied according to attorney request at the mortuary of Department of Forensic Medicine & Toxicology, King George's Medical University (KGMU), Lucknow, India, between January 2008 and December 2012 in the present study.

An in-depth examination of the epidemiological features and medico-legal aspects of these deaths from burn was performed in an effort to more clearly understand the dynamics surrounding these deaths.

Data pertaining to age, sex, family type, marital status, place of residence, psychological status, burn size [total body surface area (TBSA)] and aetiology of burns for all cases were retrieved from the autopsy reports of the university, case sheets from the hospital, the general prosecutor's investigation report and inquest reports from police by the enumerators. All enumerators were college students and were trained by the investigator. Evaluation of the data collected was performed by the investigator and the enumerators. The data collected were thoroughly revised and entered into MS-Excel spread sheets for further analysis. The procedures involved were transcription, preliminary data inspection, content analysis and interpretation.

2.2. Setting

The study was carried out in Lucknow, the capital of Uttar Pradesh, a major metropolitan city of India. According to the 2011 census Lucknow district has a population of 4,588,455¹¹ which is roughly equal to the nation of Georgia¹² or the US state of Louisiana.¹³ It is placed at 31st position in a descending order out of a total of 640 populated cities of India.¹¹ Although the total area covered by the Lucknow district is only about 2528 square kilometres (976 sq mi), the population density was much above that of the 1815 inhabitants per square kilometre (4700/sq mi).¹¹ Its population growth rate was 25.8% over the decade 2001–2011. Lucknow has a sex ratio of 906 females for every 1000 males and a literacy rate of 79.3%.

2.3. Statistical analysis

The results are presented in Mean \pm SD and percentages. The p-value < 0.05 was considered significant. All the analysis was carried out by using SPSS 16.0 version (Chicago, Inc., USA).

3. Results

Out of the total 1369 cases of burns, 536 cases (38.5%) were homicidal deaths in comparison to 857 cases (61.5%) of suicidal deaths with suicide rate of 3.7/100,000 per year and homicide rate

of 2.3/100,000 per year. Distribution of the manner of burning is shown in Table 1.

In general, female predominance was seen in both suicidal and homicidal deaths with peak age 30–39 years in suicides in contrast to 40–49 years in homicides. At younger age ≤ 19 years, the victims of suicide similar to the victims of homicide; but at extremes of ages below 10 years and above 60 years, homicides were relatively more common than suicides.

The mean age for the patients in the suicidal group was 33.74 ± 11.64 year which is almost similar to the mean ages for the homicidal group (33.62 ± 15.24) as shown in Table 1. 57.8% the cases from suicidal group came from nuclear families, compared with 44.2% of patients from homicidal group as given in Table 1.

Married victims were predominant in the homicidal group (66.6%) whereas there is no significant difference in suicidal group.

Females outnumbered males in both the groups with a gender ratio of 8.4:1 in homicidal group while 11.9:1 in suicidal group. There is no quite difference at the place where burn occurs either by homicidal or suicidal as shown in Table 2.

Depression and anxiety disorders were the most frequent psychiatric co-morbidities associated with suicidal behaviours as shown in Table 3.

Finally patients from suicidal group suffered significantly larger burns than patients from homicidal group (Table 4). 54.7% of the suicidal victim's had burns $>70\%$ TBSA.

Overall, the majority of patients from both the groups were below 39 years of age, female's outnumbered males.

4. Discussion

Burns in developing countries like India is endemic and continues to be a major challenge to the health care provider and society.

In the present study, majority of burns deaths were the result of suicidal act followed by homicidal. This rate is much higher than that reported in Western countries,¹⁴ although similar high rates are reported from India.⁹ Suicidal deaths by burning are considered like a violent intentional mechanism. In western countries, suicidal

Table 1
Bio-social characteristics of burn deaths (suicidal & homicidal).

Biosocial characteristics	Total no. of deaths	Burn		p-Value
		Suicidal N (%)	Homicidal N (%)	
Age (Years)				
≤ 19	137	67 (48.9)	70 (51.1)	$<0.001^*$
20–29	383	251 (65.5)	132 (34.5)	
30–39	416	287 (69.0)	129 (31.0)	
40–49	344	186 (54.1)	158 (45.9)	
50–59	78	53 (67.9)	25 (32.1)	
≥ 60	36	14 (38.9)	22 (61.1)	
Mean age (yrs)		33.74 ± 11.64	33.62 ± 15.24	
Sex				
Male	123	66 (53.7)	57 (46.3)	0.06
Female	1270	791 (62.3)	479 (37.7)	
Type of family				
Nuclear	732	495 (67.6)	237 (32.4)	$<0.001^*$
Joint	662	363 (54.8)	299 (45.2)	
Marital status				
Married	842	485 (57.6)	357 (42.4)	$<0.001^*$
Single	455	319 (70.1)	136 (29.9)	
Divorce	53	30 (56.6)	23 (43.4)	
Unknown	44	24 (54.5)	20 (45.5)	

*Significant.

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