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Intentional and non-intentional burn related deaths: A comparative study of socio-demographic profile

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ABSTRACT

This is a retrospective study of 1689 consecutive admissions of burn deaths to the mortuary over a period of 5 years. The socio-demographic data was collected using special Performa and interviewing the family members, relatives, neighbours and from police reports. Depending on the presence or absence of intentional intent, cases were divided into two groups and compared with regard to their socio-demographic profile. Both groups did not differ significantly with regard to age, sex and educational status. The cases with intentional deaths came from nuclear family, unmarried, student, low socio-economic status, had more stressful life events and suffered larger burns injuries compared with those who experienced non-intentional deaths. The majority of the cases were below the age of 35, unemployed and females outnumbered males in both the groups.

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 is often a catastrophic event in the life of an individual.

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%

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of all intentional 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, open cooking stove [7–10]. Burns is often reported as a non-intentional without any mention of intentional intent.

The preventable nature of the burn deaths, the environmental factors associated with it and the age groups involved, makes a study comparing socio-demographic profile and stressful life events of patients who have intentional burn death, with patients who have non-intentional burn death essential.

2. Materials and methods

2.1. Methodology

A retrospective study was done on burn deaths in Lucknow region which were autopsied according to attorney request at Forensic Medicine & Toxicology department of King George's Medical University, Lucknow, India. 1689 fatal burn cases form the material of this study. A medico-legal autopsy is mandatory in India for all unnatural deaths including those due to burns irrespective of the burns being accidental, suicidal or homicidal. An in-depth examination of the epidemiological features and medico-legal aspects of these 1689 burn deaths was performed in an effort to more clearly understand the dynamics surrounding these deaths. Retrospective data were collected from the autopsy reports of the university, case sheets from the hospital, the general prosecutor's investigations report and the inquest reports from police by the enumerators. The protocol was approved by the ethical committee prior to the commencement. A special Performa was prepared to study the socio-demographic profiles of the patients, which included age, gender, and educational status, marital status, and occupational status, type of family, monthly per capita income and percentage of burns. All enumerators were college students and were trained by the investigator. At the end of each working day, the investigator and the enumerators evaluated the data collecting process. The data collected were thoroughly, cleaned and entered into MS-Excel spread sheets and analysis was carried out.

Families consisting of father, mother and children were considered as 'nuclear', while families in which grandparents, parents, children and relatives lived under one roof, were considered as 'joint' or 'extended' [11]. Monthly per capita income represented the income of the whole family. The main purpose was to gather information about the socio-demographic details and also to find out whether or not the death resulted because of a suicide attempt. The patients were divided into two groups depending on the presence or absence of a suicidal intent. The information about the suicidal intent was obtained by speaking to patients, their blood relatives and by referring to case notes. The two groups were compared with regards to socio-demo- graphic status and stressful life events. Age, monthly income and burns size.

2.2. Setting

The study was conducted in Lucknow, the capital of Uttar Pradesh in India. Lucknow is one of the most crowded cities in the India. The population of Lucknow, according to the 2011 census Lucknow district has a population of 4,588,455 [12] roughly equal to the nation of Georgia [13] or the US state of Louisiana [14]. It is placed at 31st position in a descending order out of a total of 640 populated cities of India [12]. The district has a population density of 1.815 inhabitants per square kilometre (4700/sq mi) [12]. Its population growth rate over the decade 2001–2011 was 25.8%. Lucknow has a sex ratio of 906 females for every 1000 males, and a literacy rate of 79.3%.

A total of 20,877 autopsies performed on all types of unnatural deaths between 1st January 2008 and 27th November 2012, among them 2225 (10.7%) were the cases of burns [15]. Out of which, 858 suffered as a result of intentional death. They formed group A. The other group (group B) comprised of patients with non-intentional burn death ($n = 831$).

3. Results

Distribution of the manner of burning is shown in Table 1. Intentional burning was observed in 50.8% cases followed by non-intentional 49.2%. Females suffer burns more frequently than males (RR = 0.57 95%CI = 0.46–0.69, $p = 0.0001$). The high risk for females is associated with open fire cooking, or inherently unsafe cook stoves, which can ignite loose clothing. Open flames used for heating and lighting also pose risks, and self directed or interpersonal violence are also factors.

The two groups did not differ significantly with regards to age (Table 2) and educational status (Fig. 1).

As shown in Fig. 2, 16.1% cases of non-intentional death belonged to the low socio-economic status as compared to 9.1% of intentional deaths while there are more intentional deaths 23.9% in upper and upper middle status as compared to non-intentional 18.4%. Further, 19.5% of non-intentional death of unemployed (male/female) which were higher than intentional (13.1%) deaths. Students (27.5%) were more prone to intentional deaths as compared to non-intentional related deaths (Fig. 3).

As in Fig. 4, more intentional deaths have been pointed out in unmarried females (60.5%) as compared to non-intentional (43.2%). For married females dying due to intentional burns, 116 were married for less than 7 years and 182 more than 7 years and 50 attributed it to harassment for dowry (Fig. 5). The sources leading to intentional burn deaths found in the present study were domestic quarrels, failure in exam, failure in love, extra marital affair and family quarrel. 42.3% of

Table 1 – Manner of burn related deaths.

Gender	Group A		Group B		RR (95%CI), p-value
	No.	%	No.	%	
Male	67	7.8	153	18.4	0.57 (0.46–0.69), 0.0001*
Female	791	92.2	678	81.6	
Total	858	50.8	831	49.2	

Group A, suicide; Group B, accident; RR, relative risk; CI, confidence interval.
* Significants.