

Study of Fatal Burn Cases in Relation to Epidemiological and Socio-Economic Factors

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Abstract

Burns are amongst the leading causes of morbidity and mortality in the under-developed and developing nations. This study was undertaken to understand the Epidemiological and Socio-economic factors of the fatal burn cases coming for Autopsy. The cases were found to be more prevalent in the young age group, females, Hindu religion and lower income groups. Majority of the cases were accidental occurring from cooking apparatus at the household. The findings were compared with the other studies and results were found to be similar in most over a signification period of time, which are not only disturbing facts but needs serious social deliberation and measures so as to save precious human lives. Recommendations have been given so as to minimize such incidents at least at the household level.

Keywords: Burn Injury; Flame Burns; Kerosene Stove; Suicide; Dowry Deaths.

Introduction

Burns are amongst the leading causes of morbidity and mortality in the under-developed and developing nations. In India about 1,000,000 lakh people are moderately or severely burned every year [1]. Fatal burn injuries are not only a painful mode of death but also cause severe economic loss to community. The major reasons for the fires are use of kerosene stoves, short circuit in electrical wiring, fire crackers, industrial accidents etc. Suicide by immolation is a common method in India being more in females [2]. Sometimes a fire incident can lead to a mass disaster leading to mass casualties like Uphar Fire Tragedy, AMRI Hospital fire [3]. The Government and other social agencies have been continuously spreading the awareness for the prevention of burn injuries still the fire incidents keep on happening. This study was undertaken to understand the

demographic profile and other factors like age, sex, socioeconomic status, time of occurrence, cause of fire etc involved in the Fatal Burn Cases, so that steps can be recommended to minimize such incidents.

Materials and Methods

The study was conducted on cases coming for medico legal postmortem examination in the Department of Forensic Medicine, Maulana Azad Medical College and Associated hospitals, New Delhi during the period 2006-2007. All cases of flame burns injuries with known time of incidence were included in the study. The chemical and electric burns cases and decomposed bodies were excluded from the study. 50 cases studied with information of every case were recorded in detailed proforma for critical analyses.

Results and Observations

Detailed observation of 50 autopsies performed in the mortuary of Maulana Azad Medical College and associated hospitals with burn injury with known method during the period from Jan. 2007 to Feb. 2008 were carried out and various epidemiological statistical results were drawn from the data.

The most vulnerable age group involved between 21 to 30 years of age comprising 50% of total 50 cases followed by age group of 31 to 40 years comprising 20% of cases. Female comprised 38 cases i.e. 76% of total cases, while males were only 12 in number i.e. 24% of total cases. (Table 1). Most of the burn occurred during the period between 18.01 pm to 21.00 pm which accounted for 24% of total cases followed by the period of 21.00 pm to 24.00 pm during which 16% of all burn cases occurred (Table 2). Maximum

numbers of victims of burn injuries were from the lower income group i.e. 86% of total cases. Next in the frequency were from middle income group i.e. 14% of total cases. No case was reported from the higher income group (Table 3). 84% were Hindu of whom 31 were females (62%), while Muslim women were only 7 (14%) of the total cases (Table 4). Cooking apparatus were the most frequent source of fire, responsible for 32 cases of the burn fatalities with the use of kerosene oil pressure stoves (64%) followed by LPG cooking gas only in 04 cases (8%). The fire caught by petrol was seen in one case and by Angithi fire was seen in one case of the total cases. Strong suspicion of starting the fire by pouring kerosene oil over the body was observed in 12 cases in which 9 cases were females (Table 5). It was observed that 98% of the accident leading to burn occurred within the home for the small 2% of the accident occurred outside the home (Table 6).

Table 1: Showing age and sex wise distribution cases

S. No.	Age Group	Males	Females	Total	%
1.	0-10	-	-	-	-
2.	11-20	3	5	8	16%
3.	21-30	6	19	25	50%
4.	31-40	2	8	10	20%
5.	41-50	-	4	4	8%
6.	51-60	1	1	2	4%
7.	61-70	-	-	-	-
8.	71-80	-	1	1	2%
	Total	12	38	50	100%

Table 2: Diurnal variation

S. No.	Time Period	No. of Cases	% of Cases
1.	12am to 3am	7	14%
2.	3.01am to 6 am	-	-
3.	6.01 am to 9 am	6	12%
4.	9.01 am to 12 pm	4	8%
5.	12.01 pm to 15.00pm	6	12%
6.	15.01 pm to 18.00 pm	7	14%
7.	18.01 pm to 21.00 pm	12	24%
8.	21.01 pm to 24.00 pm	8	16%
	Total	50	100%

Table 3: Socio-economic status of cases

S. No.	Socio-Economic Status	No. of Cases	% of Cases
1.	Higher Income Group	-	-
2.	Middle Income Group	07	14%
3.	Lower Income Group	43	86%
	Total	50	100%

Table 4: Religious affiliation of the victims

S. No.	Religion	Male		Female		Total	
		No.	%	No.	%	No.	%
1.	Hindu	11	22%	31	62%	42	84%
2.	Muslim	1	2%	7	14%	8	16%
	Total	12	24%	38	76%	50	100%

Table 5: Source and manner of fire

Nature of death motive / circumstances	Male		Female		Total	
	No.	%	No.	%	No.	%
Accidental while cooking						
Kerosene stove	7	14%	25	50%	32	64%
Cooking gas	01	2%	03	6%	04	8%
Angithi Fire	-	-	01	2%	01	2%
Total	08	16%	29	58%	37	74%
Suicidal						
Kerosene Oil / Dowry	3	6%	09	18%	12	24%
Petrol	01	2%	-	-	01	2%
Total	04	8%	09	18%	13	26%
Grand Total (1+2)	12	24%	38	76%	50	100%

Table 6: Showing location of the accident

S. No.	Place of Accident	No. of Cases	Total	%
1.	Home	49	49	98%
2.	Outside home	01	01	2%
	Total	50	50	100%

Discussion

This study represents only a part of the problem of total burn injuries since the total number of such cases are distributed in different mortuaries which are catering to different regions/areas of the Delhi. 70% of the cases were found in the age group of 21-40 years and females were the predominant group. Females are mainly involved in the kitchen chores in Indian Social setup. In our study the burns from cooking apparatus accounted for 72% of the total burns. Moreover suicide by burning is a common method in females in our country [2]. Females committing suicide were about double than the males in the present study. The females in our country are more subjected to family tensions, domestic violence and not to forget the demand for dowry. The authors feel that in a depressed state of mind they have an easy access to a method of suicide leading to Self-immolation. This can be corroborated with the fact that the numbers of Hindu females are about 4.5 times than Muslims where the custom of dowry is not that much prevalent [4,5]. Many times the suicidal burns are passed by the relatives as accidental by giving false history to the police.

The main kerosene pressure stoves were found to be the main culprit in our study. The chain of events leading to fire was discussed with the relatives and witnesses. It was observed that in most of the cases the burner of the stoves get blocked in between the cooking, when the victim tried to get rid of this blockage by using a pin without releasing the pressure of the stoves so due to pressure of the stoves the kerosene oil spills over the body and clothes and

fire occurred. In some cases due to excess pressure of the stoves, the stoves were burst and caused the fire. This can be understood from the fact that most of the victims of fire were from the lower income group living in a over-crowded small houses and more susceptible to fire safety due to paucity of space with kitchen work and living area being accommodated in one room only. The time of the incidents in most of the cases coincided with the times of food preparation. The Indian women generally wear synthetic clothes with loose hanging drapes like chunni, saree in the households which easily catches fire by a flame while cooking with a little amount of carelessness.

The authors compared their findings with other studies done in different regions of country and found that results are similar in most despite the passage of time from 1989 to 2015 [4-13]. This is disturbing facts and needs serious social deliberation and measures so as to save precious human lives.

Recommendations

Flame burns not only contribute as a potential factor in increasing the amount of morbidity and mortality, but also a painful method of death. The following measures should be taken as preventive steps to minimize such incidents at least in a Household.

1. The kerosene pressure stoves should be made of good quality to minimize the bursts of the stove and their flames should be guarded.
2. Women working in the kitchen should be careful about their clothing particularly drapes.

3. Inflammable materials should not be kept close to the source of fire.
4. Dowry deaths should be prevented by making more strict laws for offender and preventive intervention by police.
5. Housing conditions needs to be improved so that every family can live in a built house with fire safety features.
6. In areas where complete LPG coverage has been done the manufacture and sale of kerosene pressure stoves should be banned.
7. Government should take the necessary steps by educating particularly in area where the uses of kerosene oil stoves are still prevalent.

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