

Medicolegal Study of Agent of Fire Burn in Young Married Female in Autopsy Cases

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Abstract: Dry thermal burns are one of the most devastating conditions encountered in health. The dry thermal burns injury represents an assault on all aspects of the patient, from the physical to the psychological. Autopsy has previously been shown to be a useful retrospective diagnostic tool; however we challenge its reliability as a result of our study. Aim of the study: Distribution of burn cases on the basis of agent of fire among study group. To highlights problem regarding agent of fire in victims. In most of the cases agent of fire is stove explosion 23.3 % in burn victim.

Keywords: Agent of fire; Unnatural death; Dowry death; Thermal burn; Forensic medicine, Medico legal study

1. Introduction

There are various type of burn like thermal, flash burns, flame burns, scald burns, contact burns, chemical, electrical, radiological. [1]. The most common type of radiation burn is sunburns. On the other hand, x-rays and radiation therapy can also cause injury, in which cause the patient may be eligible to file medical malpractice charges.

Medico- legal study define as study of, relating to, or concerned with both medicine and law, as when medical testing or examination is undertaken for a legal purpose [2].

Burn injuries are dry thermal injury caused due to contact with dry heat such as flame, radiant heat or some heated solid substance like metal or glass, to the body surface [3].

Mammalian tissue can survive only within a relatively within narrow range of temperature, 22-44 °C [4]. Autopsy has previously been shown to be a useful retrospective diagnostic tool; however we challenge its reliability as a result of our study [5]. In 2011 census Varanasi had population of 3,676,841 of which male and female were 1,921,857 and 1,754,984 respectively [6]. It is arrived at by comparing the number of people found to have the condition with the total number of people studied [6].

Death due to fire (death due to burns) In India there are several thousands of deaths occurring due to fire or burns [8]. Unfortunately a vast majority of these cases occur in the home and are due to smoking, defective electrical wiring, defective kerosene stove bursts, attempted suicides by self-immolation, homicidal burns of young women by the husband or in-laws (Dowry deaths/bride burning [9] (10,11), etc.

The Aim of the Study

Distribution of burn cases on the basis of agent of fire among study group. To highlights problem regarding burn deaths victims.

2. Material and Method

Present prospective study was carried out on medico legal study of burn autopsy in Unnao, India. Study data was

collected for the duration from 1st January 2013 to 30 June 2014. During this period total of 450 burn death cases were recorded out of 3149 medico-legal postmortem conducted. Data was analyzed prospectively in respect of prevalence, surface area, degree of burn, cause of death.

3. Observations and Results

Table 1: Shows the distribution of number of burn cases during the study periods, total number of different autopsy victims were 3149, total number of burn autopsy were 600(19.05%), total number of burn cases recorded for study during this period were 450(14.29%), which forms a considerable bulk and draws attention to the grievousness of this problem.

Table 2: Distribution of burn cases in different age group with sex among the studied burn cases (N=450) shows that maximum of the victims of burn deaths were in the age group 21-30 year followed by 31-40 years. Most of the victims of burn deaths were recorded at 21-40 year (which is more than half of the total burn death) with peak incidence at 21-30 year 44.89%. Extremes of ages are least involved as compared to adult age group as seen in tables for age and sex incidence. $X^2 = 32.44$, $DF = 7$, $P = < 0.001$ and there is significant association with age.

Table3: Describe the marital status of the studied victim showing married female (84.01%) outnumbered the unmarried female (15.99%), in male married 80.22% outnumber the 19.33 % unmarried male. $X^2 = 24.64$; $DF = 2$; $P = < 0.001$ and there is significant association with marital status.

Table 4: Show that distribution of burn cases on the basis of agent of fire among study group most common agent of fire was replaced by stove explosion cases 105 i.e. 23.33%, followed by using match stick victims 89 i.e. 19.78% and kerosene lamp cases 79 i.e. 17.56% Chulha case 70 i.e. 15.56%, LPG gas 14.67%, during electric work 2.44%, wooden flame 1.78%. Other include less than 1% like madha, arti lamp, campfire, vehicle accident, during save to other, bhujja, machine failure.

4. Discussion

Our study showed that distribution of burn cases on the basis of agent of fire among study group represent stove explosion cases 105 i.e. 23.33%, followed by using match stick victims 89 i.e. 19.78% and kerosene lamp cases 79 i.e. 17.56% Chulha case 70 i.e. 15.56%, LPG gas 14.67%, during electric work 2.44%, wooden flame 1.78%. Other includes less than 1% like madha, arti lamp, campfire, vehicle accident, while saveing to other, bhuja, machine failure.

Regarding agent of fire were more or less based on history by relative like husband, father in law etc, all they try to make housewives victim were accidental and most of the time victims are alone at home and death are unwitnessed.

Other study found about similar finding that the alleged accidental burn cases were observed to be most commonly due to some form of cooking apparatus [17]. Two-thirds of these suicides were associated with kerosene and purposeful ignition and most sustained associated anatomic signs of smoke inhalation, such as soot in the respiratory tract or stomach, generalized visceral congestion and ischemia [18].

Kerosene burner, kerosene lamp, wood burner, cooking gas and coal burner were the common causative agents for accidental burning. Whereas pouring of kerosene over body and thereby lighting with matchstick was the leading cause for suicidal and homicidal burning. Thus kerosene was mainly accounted causative factor for burns with kerosene burner, pouring of kerosene and kerosene lamp as the common causative agents for burning. This is probably because the kerosene is cheap and easily accessible and more use of kerosene burner and lamp by the people of low socio-economic strata in India, where obsolete and unsafe uses of fire for light and cooking are still prevalent. [19,20,21] Reported that the kerosene burner as the commonest causative agent for burning. [22] in their study found that the largest number of burn deaths were due to the use of match sticks (35.6%) followed by wood burner (28.7%), kerosene burner (18.4%), angithi/coke oven (11.5%) and kerosene lamp (5.8%). [23] reported wood burner (40%), kerosene burner (34.3%) and kerosene lamp (20%) as the common causative agents for accidental burning and pouring of kerosene over body for suicidal (42.6%) and homicidal burning (40.6%). [24] observed that most of the suicidal burnings were performed by pouring kerosene over the body and then setting it alight with matchstick. But, [25] reported Kangri (60%) and kerosene stove (30%) as the commonest causative agents of burns in Kashmir. Thus the findings are more or less similar to other studies in India but are in sharp contrast to the studies

carried out in western countries where smoking, housefire, solvents and automobiles were reported to be the main causes of burning [26] and at Brisbane and Queensland reported flame burns (56%) as the commonest cause of burning followed by scalds (26%); and domestic flammable agents, particularly the petrol as the main causative factor for burning. In Singapore, Angola, Ivory Coast and Ferdon, scalds were reported to be the major cause of burning.

5. Conclusion

- Agent of fire among study group represent stove explosion cases 105 i.e. 23.33%, followed by using match stick victims 89 i.e. 19.78% and kerosene lamp cases 79 i.e. 17.56% Chulha case 70 i.e. 15.56%, LPG gas 14.67%, during electric work 2.44%, wooden flame 1.78%. Other includes less than 1% like madha, arti lamp, campfire, vehicle accident, while saveing to other, bhuja, machine failure.
- As study 14.29% which forms a considerable bulk and draws attention to the grievousness of this problem.
- Educating the people about safety measures through various programmes, television, and other media, warning label or cautionary information accompanying the sale of gasoline, kerosene or petrol into any container.
- Intersectorial coordination.

6. Acknowledgement

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7. Funding Source

This research was not financially supported by any funding agencies.

8. Ethics Statement

The present study was approved by “Institutional Ethics Committee” of Institute of Medical Sciences, Banaras Hindu University. All the information has been taken under consideration of medical ethical committee.

9. Conflict of Interest

Nil

10. Tables and Charts

Table 1: Distribution of incidence of burn autopsy cases during the study period from 1 January 2013 to 30 June 2014

Total number of different autopsy cases	Total number of burn autopsy cases	% of total number of burn autopsy cases	Total number of burn cases for study	% of total number of burn cases for study	Total No. of autopsy due to other cause	% of total No. of autopsy due to other cause
3149	600	19.05	450	14.29	2549	80.95

Table 2: Distribution of burn cases in different age group with sex among the studied burn cases (N=450):

Age group (in year)	Total No of cases	% of total cases	Male		Female	
			No. of cases	% of cases	No. of cases	% of cases
0-10	19	4.22	9	11.11	10	2.71
11-20	87	19.33	11	13.58	76	20.60
21-30	202	44.89	25	30.86	177	47.97
31-40	93	20.67	18	22.22	75	20.33
41-50	27	6.00	11	13.58	16	4.34
51-60	12	2.67	5	6.17	7	1.90
61-70	7	1.56	2	2.47	5	1.36
>71	3	0.67	0	0.00	3	0.81
Total	450	100	81	18.00	369	82.00

Note: $X^2 = 32.44$, $DF = 7$, $P = < 0.001$

Table 3: Distribution of burn cases on the basis of marital status and gender among the studied burn cases (N=450):

Marital status	Total No. of cases	% of total No.	Male cases	% of male cases	Female cases	% of Female cases
Married	361	80.22	51	62.96	310	84.01
Unmarried	87	19.33	28	34.57	59	15.99
Unknown	2	0.44	2	2.47	0	0.00
Total	450	100.00	81	18.00	369	82.00

Table 4: Distribution of burn cases on the basis of agent of fire among study group (N=450):

S. No.	Agent of fire	Total No. of cases	% of total cases
1	Stove explosion	105	23.33
2	Match stick	89	19.78
3	Kerosene lamp	79	17.56
4	Chulha	70	15.56
5	LPG gas	66	14.67
6	Electric work	11	2.44
7	Wooden flame	8	1.78
8	Madha	4	0.89
9	Arti lamp	4	0.89
10	Camp fire	4	0.89
11	Vehicle accident	2	0.44
12	During save to other	2	0.44
13	Other (by other person, bhujja, machine failure,)	3	0.67
14	Unknown	3	0.67
	Total	450	100.00

Graphical representation of table discussed above is shown by diagram here under

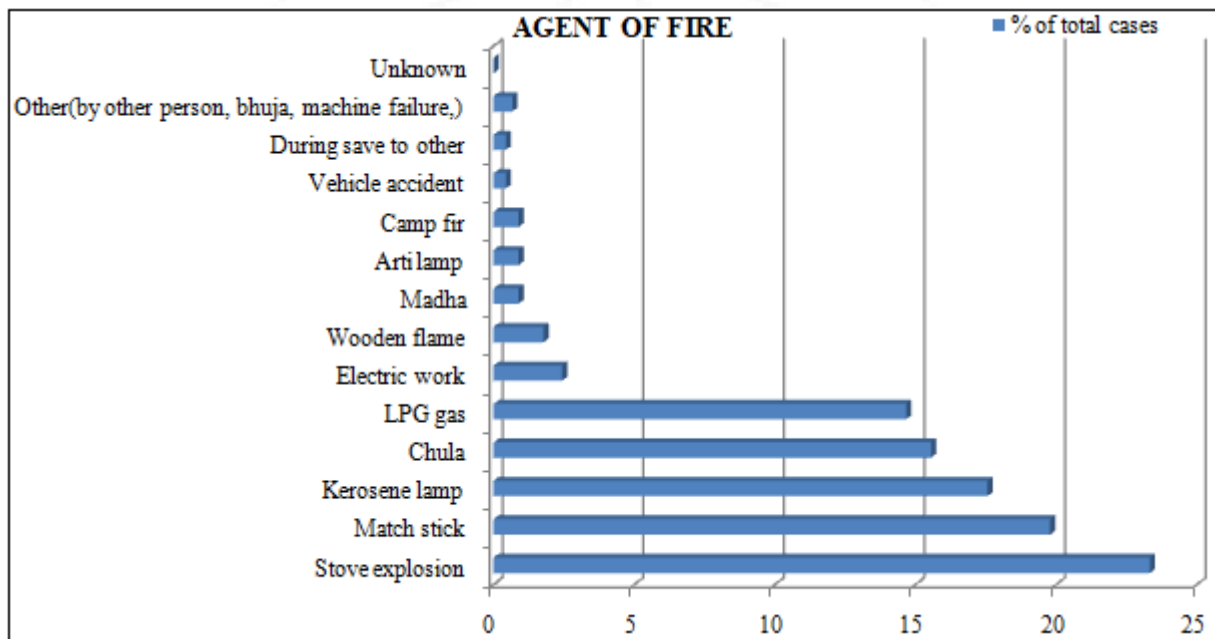


Figure 4: Column diagram shows that distribution of burn cases on the basis of agent of fire among study group (N=450)

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