

Original Research Paper

An Epidemiological Retrospective Study of Autopsied Dry Thermal Burn

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Abstract

The present retrospective study has been conducted for the period of 5 years i.e. 2009 to 2013 based on autopsy of the unnatural death cases resulting from burn. During study period out of total 10215 unnatural Death cases death due to burn injuries was 1911. These cases brought to the Department of Forensic Medicine, IMS, BHU, Varanasi. Thermal burn injuries were averaging 18.65%. Female burn deaths dominated over male in the ratio of 3.52:1. Predominant age group found to be 21-30 years (48.72%) followed by age group 11-20 (23.11%). Most of the deceased were from the married group (63%) followed by unmarried (15%). Manner of burn death was unknown in most of the cases (96.86%) followed by accidental burn deaths (2.98%) suicidal (0.1%) and homicidal (.05%). Involvement of rural population is more 92.78% than urban population (6.49%). Religion wise Hindu (96.70%) predominated over other religions.

Key Words: Unnatural death; Dowry death; Burn injuries; Executive Magistrate

Introduction:

Man has invented fire since time immortal. The use of fire in various aspects has not only added to his comforts but also added to his misuses by increasing the risk of burns. Fire was perhaps man's first double-edged sword, evidenced throughout history; it has served as well as destroyed mankind. [1]

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. [2] Mammalian tissue can survive only within a relatively within narrow range of temperature, 22-44°C. [3] Thus burning usually occurs due to contact with flame it may be caused due to contact with hot metal or any other hot solid or hot liquid. The severity of burning extremely depends on the degree of heat, period of exposure, intensity of heat and age of the person. Burn deaths have tremendous medico-legal importance as they may be considered to be the commonest cause of unnatural deaths in India.

Often, the manner of burns is closed in mystery, and unreliable statements. The reason behind this action may be personal, domestic, occupational or social tragedy and more recently dowry deaths. Married female burn death where death of female occurs below 30 year and within seven years of her marriage such death cases investigated by Magistrate under 176 Cr.P.C (Dowry death) and other female burn and male burn deaths as routinely investigated by police as per section 174 of Cr.P.C.

In India below 7 year married female burn deaths are linked with Dowry death, where a young married women attempt or commits suicide in consequent to their being subjected to harassment by their husband or in-laws or his relative or cruelty constitute the offence of Dowry death, a monstrous social evil is widely prevalent and deep rooted in society in spite of most of the awareness programmers but this is due to adequate legal system but her implementation and administration are not stringent. [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] Social Forensic Message is Safety first in fire situations and always x-ray burnt human remains. Scene Visit As indicated and felt necessary and crime Scene evaluation report by Police as necessary. [6]

A burn injuries death is very painful but what compels or in what circumstances women or men commits suicide or homicide or those accidentally burned but most heinous is burning

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of newly married women i.e. homicidal burning. In this respect it is very difficult to find out the manner (Suicidal, Accidental and Homicidal) of burn injuries that in what circumstances the burn injuries took place, it can only be possible by meticulous investigation of scene of crime and interrogation of person concerned.

Aims and Objectives:

To find out how dry thermal burn affect incidence, age, sex, habitat, marital status, religious, manner of death and its medico-legal consequence.

Material and Method:

Present retrospective study was carried out on the unnatural burn death cases brought by police to the Department of Forensic Medicine, Institute of Medical Sciences, Banaras Hindu University, from Varanasi itself and nearby districts and western part of Bihar and Madhya Pradesh for treatment then if death at Varanasi in different hospital occur then the dead body after inquest send to institute of medical science Banaras Hindu university for medico-legal autopsy examination.

Study data was collected from autopsied record register for the duration from 1st January 2009 to 31st December 2013.

During this period out of 10215 medico-legal post-mortem conducted and total 1911 burn death cases were recorded. Data was analyzed retrospectively in respect of incidence of burn deaths in five consecutive year, age group, sex habitat of death religion factor, manner of death and other relevant data.

Observation and Results:

In our study total thermal burn death 1911 (18.71%) of total autopsy 10215 was conducted and the distribution of cases of the total unnatural deaths and thermal burn death reported during the 5 year study period from 2009 to 2013 deaths due to burn injuries were 17.82%, 17.70%, 17.83%, 20.56%, 19.49%, respectively (and average 18.65% per year).

It was more or less steady trend which is almost static. (Table 1) Male comprised of 22.14% of total burn death. Female (77.86%) preponderance was seen in burning with male female ratio equal to 1:3.52. (Table 2)

In present study maximum of the victims of burn deaths were in the age group 21-30 year followed by 31-40 years in the 5 year. 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 (48.72%). Extremes of ages are least involved as compared to adult age group. (Table 3)

In this study married female (81.13%) outnumbered the unmarried female (17.27%), in male unmarried 8.51% outnumber the 0.47 % married male. (Table 4) Regarding marital status and manner of death most of the victims died of unknown manner (83.31%) and are married followed by unmarried group (12.27%).

Accidental unmarried (51%) were more than accidental married (1%), homicidal, suicidal are not differentiated. (Table 5) In our research manner of death in 96.86% case were unknown, accidental in 2.98%, suicidal 0.10% and homicidal 0.05%. (Table 6)

Majority of studied victims (92.78%) were from rural area, 6.49% are from urban area and 0.73% case for which locality is unknown. (Table 7) In this study majority of the burn victims case (96.7%) were Hindu and 2.7% are Muslims but 0.57% of unknown case and their religion was not known. (Table 8)

Discussion:

Incidence of burn death on the basis of 5 consecutive year 2000 to 2013 among cause of total death 10215, death due to burn 1911 which is 2nd most common cause of death after road traffic accident, it is due to more contact with heat. Other studies also similar to this showed burn is major cause of death. [7]

Analysis of sex record in present study showed that female (77.86%) superseded than male (22.14%) i.e. male: female ratio 1:3.52, other study similar to this that female predominate than male. [7, 11-13]. But Mostafa M. et al study was contrast to this i.e. male predominates than female. [8]

As the female burn deaths reported to Police irrespective of its manner and registered under 304B IPC (Dowry death) all the family members of in-laws side alleged in causing death of female are arrested and send to jail. [2]

In our study 21- 30 year is the most commonage group affected by burn death (46%) followed by 21-11 year (21%) with preponderance of female similar to other authors. [7, 10]

The high mortality in this age group 21-30 year can be due to young adolescent in this age group fail to stand the stress of examination and job failure. Present study showed that married female burn death more common than unmarried females and males other study also find similar result i.e. housewives were more common. [7, 11]

Among known manner of death accidental manner was more common than homicidal and suicidal, which are very less number, consistent with others findings. [13-15]

Regarding manner of death most of the case was due to unknown manner and homicidal, suicidal and accident are less number because no adequate criteria for such differentiation during autopsy but they can be differentiated by investigation and inquiry of case regarding fact.

In our study most of the burn death were from rural locality (92.78%) than urban locality other study also find that rural burn death predominant than urban. [13] But Rahul Chawla et al study is contrast to this and showed that urban area much more common than rural. [7]

We also found that majority of the burn death victim were Hindu and only 2.72% belong to Muslim, reason behind it was the Hindu dominant population. These findings confined to other study also. [9, 15]

Conclusion:

- Dry thermal burn death is the 2nd most common cause of death after road traffic death. Male female ratio is equal to 1:3.52.
- 21 to 30 year is the most common cause of burn death (46%) followed by 21 to 11 year (21%).
- Married female burn death more common than unmarried females.
- Regarding manner of death most of the case are unknown manner and homicidal, suicidal and accident are less number.
- Majority of studied victims 92.78% were from rural area.
- Majority of the burn victim's death on the studied case i.e. 96.70% were Hindu.

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Table1: Incidence of Burn Deaths in Medico-legal Autopsy from 2009 to 2013

Year	Total Autopsy Case (%)	Thermal Burn Death (%)
2009	1986(19.44)	354(17.82)
2010	2045(20.01)	362(17.70)
2011	1974(19.32)	352(17.83)
2012	2081(20.37)	428(20.56)
2013	2129(20.84)	415(19.49)
Total	10215(100)	1911(100)

Table 2: Sex wise Distribution of Burn Case

Year	Male (%)	Female (%)	Total (%)
2009	101(23.88)	252(16.94)	353(18)
2010	69(16.31)	293(19.69)	362(19)
2011	70(16.55)	283(19.02)	353(18)
2012	99(23.4)	329(22.11)	428(22)
2013	84(19.86)	331(22.24)	415(22)
Total	423(22.14)	1488(77.86)	1911(100)

Table 3: Age and Sex Wise Distribution (2009 To 2013)

Age Grps (yrs)	Male (%)	Female (%)	Total (%)
0-10	20(5)	44(2.6)	64(3)
11-20	62(15)	344(23.11)	406(21)
21-30	158(37)	725(48.72)	883(46)
31-40	101(24)	244(16.39)	345(18)
41-50	41(10)	66(4.43)	107(6)
51-60	23(5)	26(1.74)	49(3)
61-70	14(3)	24(1.61)	38(2)
>71	4(1)	15(1.0)	19(1.0)
Total	423(100)	1488(100)	1911(100)

Table 4: Marital Status of Burn Death Cases

Marital Status	Male (%)	Female (%)	Total (%)
Married	2(0.47)	1207(81.13)	1209(63)
Unmarried	36(8.51)	257(17.25)	293(15)
Unknown	385(91.01)	24(1.62)	409(21)
Total	423(100)	1488(100)	1911(100)

Table 6: According to Manner of Death

Manner	Frequency	%
Accident	57	02.98
Homicidal	1	00.05
Suicidal	2	00.10
Natural	Nil	nil
Unknown	1851	96.86
Total	1911	100

Table 7: According to Habitat Rural and Urban

Habitat	Frequency	%
Rural	1773	92.78
Urban	124	06.49
Unknown	14	00.73
	1911	100

Table 8: According to Religion

Religious	Frequency	%
Hindu	1848	96.70
Muslim	52	02.72
Christian	Nil	Nil
Unknown	11	00.58
	1911	100

**Table 5
According to Marital Status and Manner of Death**

Marital status	Manner of Death					Total (%)
	Accident (%)	Homicidal	Natural	Suicidal	Unknown (%)	
Married	1(2)	Nil	nil	Nil	1208(65)	1209(63)
Unmarried	51(89)	Nil	nil	Nil	242(13)	293(15)
Unknown	5(9)	1	Nil	2	401(22)	409(21)
Total	57(100)	1	Nil	2	1851(00)	1911(100)