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Research Article

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MEDICO-LEGAL STUDY OF TIME AND SITE OF INCIDENCE AND SEASONAL VARIATION OF UNNATURAL DEATH DUE TO DRY THERMAL BURN AT VARANASI; INDIA

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Abstract

Unnatural death- is a category used by coroners and vital statistics specialists for classifying all human deaths not properly describable as death by natural causes. 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. Incidence is a measure of the probability of occurrence of a given medical condition. Seasonal variation is a component of a time series which is defined as the repetitive and predictable movement around the trend line in one year or less. Present prospective 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. Aim of the study to find out how dry thermal burn affect time of incidence and seasonal variation. To highlights problem regarding burn deaths. Times of incidence of burn were at evening, 247 cases i.e. 54.89%. Place of incidence in bulk of victim were during kitchen activity 256 cases i.e. 56.89%. More number of cases in summer season 53.33% followed by rainy season 25.78%. Conclusion and suggestion need to education, promoting women liberation, running anti-dowry campaigns, counseling / guidance.

Key Words: Unnatural death; Medico-legal study; Dowry death; Burn; Forensic medicine; Time of incidence; Seasonal variation.

INTRODUCTION

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 **[1]**. The reason behind this action may be personal, domestic, occupational or social tragedy and more recently dowry deaths. Autopsy has previously been shown to be a useful retrospective diagnostic tool; however we challenge its reliability as a result of our study **[2]**.

Thanatology: deals with death in all aspects. Section 46 IPC death denotes death of a human being unless the contrary appears from the context. Registration of birth and deaths act section 2(b) defines death as permanent disappearance of all evidence of life at any time after live birth has taken place. **Natural** death where a lesion is found at autopsy which is incompatible with life and which is known to cause of death. **Unnatural death**- is a category used by coroners and vital statistics specialists for classifying all human deaths not properly describable as death by natural causes **[3]**. 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 [4]. Incidence is a measure of the probability of occurrence of a given medical condition in a population within a specified period of time. Although sometimes loosely expressed simply as the number of new cases during some time period, it is better expressed as a proportion or a rate with a denominator**[5]**.

In statistics, many time series exhibit cyclic variation known as seasonality, seasonal variation, periodic variation, or periodic fluctuations. This variation can be either regular or semi-regular. Seasonal variation is a component of a time series which is defined as the repetitive and predictable movement around the trend line in one year or less. It is detected by measuring the quantity of interest for small time intervals, such as days, weeks, months or quarters. Organizations facing seasonal variations, like the motor vehicle industry, are often interested in knowing their performance relative to the normal seasonal variation. The same applies to the ministry of employment which expects unemployment to

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increase in June because recent graduates are just arriving into the job market and schools have also been given a vacation for the summer. That unemployment increased as predicted is a moot point; the relevant factor is whether the increase is more or less than expected. Organizations affected by seasonal variation need to identify and measure this seasonality to help with planning for temporary increases or decreases in labor requirements, inventory, training, periodic maintenance, and so forth. Apart from these considerations, the organizations need to know if the variation they have experienced has been more or less than the expected, given the usual seasonal variations [**6**]. In 2011, Varanasi had population of 3,676,841 of which male and female were 1,921,857 and 1,754,984 respectively [**7**].

THE AIM OF THE STUDY

To find out how dry thermal burn affect time of incidence and seasonal variation.
To highlights problem regarding burn deaths.

MATERIAL AND METHOD

Present prospective 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 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 incidence of burn deaths in, education, occupation, income, and socioeconomic status and other relevant data.

RESULTS AND OBSERVATION

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

Table 2: Present study show that in most of the cases time of incidence of burn were at evening, 247 cases i.e. 54.89% followed by morning 183 cases i.e. 40.67%, and at noon 12 cases i.e. 2.67%. Unknown cases are only 2 i.e. 0.44% for whom time of incidence was not known.

Table 3: Shows that distribution of burn cases on the basis of site of incidence among study group. Place of incidence in bulk of victim were during kitchen activity 256 cases i.e. 56.89%, followed by living room 149 cases 33.11% and courtyard 12 cases 2.67%.Other vehicle form less chance like farm house, factory, road, madha, temple, roof.

Table 4 and Graph 1: Show that more number of cases in summer season 53.33% followed by rainy season 25.78% and less number of cases were in winter 20.89%. Male cases are outnumbered in summer than female, but female victims are outnumbered in rainy season. In winter there is slight difference.$X^2 = 3.80$; DF = 2; P = 0.15, find that there is no significant association between seasonal variation and gender.

DISCUSSION

INCIDENCE

In our study it is observed that incidence of death due to fatal burns is 600 in No. i.e. 19.05 % of total cases collected from 1 January 2013 to 30 June 2014,which is the second commonest cause of death next to road traffic accidents. Every year there is slight increase in burn death cases because numbers of patient are also increasing every year.

In a previous study by [**8**] he found that deaths due to burning accounted for 25.41% of the total medico legal autopsy deaths cases which was greater than the present study.

In another study done by [**9**] it was observed that death due to burns accounted for 18.20% of all medico legal autopsy cases which was more or less similar to present study. This finding is consistent with the study of [**10, 11, and 12**].The difference in the percentage is due to differences in the region from where study was carried out. Again it indicates that burn autopsies comprises of major bulk of medico–legal autopsies in India.

The present study is in conformity with the study conducted by [**8, 9**]. Burn has been reported to be the second most common cause of death in all medico legal cases. Existing dowry system plays its own part in such deaths [**13**].

TIME OF INCIDENCE

Our study showed that (Table.2) the incidence time of most of the victims were at evening in 247 cases i.e. 54.89% followed by time of incidence was in the morning 183 cases i.e. 40.67%, and at noon 12 cases i.e. 2.67%. Unknown cases are only 2 i.e. 0.44% for which time of incidence was not known or unwitnessed.

More incidences at evening may be due to kitchen activity, people of background, rural students using local lamp etc, and most of the time in evening hours family members are out for marketing or some other work.

Our findings were in conformity with those of other studies show that Number of female victims sustaining burn to be more during night hours 44 cases (46.80%) **[13].**

One third injuries have occurred between 4 pm to 8 pm **[14]** and were similar to a study conducted in India **[15].** This is the period when evening meals are cooked and lighting equipment are used.

SITE OF INCIDENCE

Regarding site of incidence (Table 3) shows that distribution of burn cases on the basis of site of incidence among study group. Major bulk of victim were received fatal burn injury during kitchen activity 256 cases i.e. 56.89%, followed by living room 149 cases 33.11% and courtyard 12 cases 2.67%. Other site form less chance like farm house, factory, road, madha, temple, and roof.

Female predominance in open and unguarded cooking fire is very common in the low socio economic, agricultural and rural Indian society due to the cost factor. The low socio economic status, large families, small living space, stove and Chula at floor level collectively increases the risks for these unfortunate incidences **[13].** Most of them have sustained injuries at home **[14].** These results are similar to other studies **[16, 17, and 18]** and suggest one's own home can become a death trap as heat generating appliances are regularly used. In other study find that kitchen activity finds 62% cases **[19].**

SEASONAL VARIATION

In the present it was observed study that more number of burn death recorded cases in summer season i.e. 53.33% followed by rainy season 25.78% and least number of cases were recorded in the month of winter i.e. 20.89%. Male burn death cases were outnumbered in summer than female; whereas female victims are more involved in rainy season. In winter there is slight difference between involved sexes. Male % of burn death cases was more in summer than female percentage. Our findings were in conformity with those of other studies show that more number of cases in summer season 43.5% followed by winter season 34.7% and less number of cases were in rainy 21.80% **[20].**

CONCLUSION AND SUGGESTION

EDUCATION

Educating the peoples regarding safety measures through various programme like television, radio, newspaper, warning label and cautionary information about accompanying the sale of gasoline, kerosene or petrol into any container.

The majorities affected are females and most of the burn accidents are preventable by taking extra care in kitchen. Hence, housewives should be target for education in prevention of burns.

To check such suicides following measures are recommended. Increase the standard of education amongst women making them more independent economically and mentally.

Legislation passed by the government to abolish the dowry related crimes.

Establishment of voluntary associations to spread anti-dowry feelings amongst the masses

PROMOTING WOMEN LIBERATION

More and more institutions should be created providing education to women exclusively. Vocational training, job oriented courses should be provided through these institutions, so that it creates more job potentials for women and that they become economically independent and free from all socio-cultural bandages.

RUNNING ANTI-DOWRY CAMPAIGNS

These can be effectively run through various NGO's, welfare organizations, academic and industrial organizations with an aim to impress on the women in

general to resist all pressings which simply turn them into chattels. At least a day, if not a weak, should be declared and observed as "Anti-dowry day". Serious multiple and prolonged efforts shall be made by all leaders - whether social / political / religious to avoid the greed and desire of men in general to achieve wealth through alternative and easy means.

SOCIAL BOYCOTT

Costly and ostentatious marriage rituals should be discouraged and society should boycott the tainted man and their families in all future marriage negotiations.

COUNSELING / GUIDANCE

Centers shall be developed to provide free counseling to the families and newlywed couple about their expected problems and their solutions in initial years of their interaction and formative years of new social and familial relationship so that story of their rest of the life in their new role is nicely scripted.

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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.

CONFLICT OF INTEREST

Nil

TABLES AND FIGURE

Table 2 Distribution of burn cases on the basis of **time of incidence** among study group (N=450)

Time of incidence	Total No. of cases	% of total case
Morning	183	40.67
Noon	12	2.67
Evening	247	54.89
Midnight	6	1.33
Unknown	2	0.44
Total	450	100.00

Table 3 Distribution of burn cases on the basis of **site of incidence** among study group (N=450):

Place of incidence	Total No. of cases	% of total cases
Kitchen	256	56.89
Living room	149	33.11
Courtyard	12	2.67
Farm house	10	2.22
Road	8	1.78
Madha	8	1.78
Temple	3	0.67
Roof	2	0.44
Factory	1	0.22
Unknown	1	0.22
Total	450	100.00

Table 4 Distribution of burn cases on the basis of **seasonal variation** with gender among study group (N=450)

Season	Total No. of cases	% of total cases	Male No. of cases	% of male cases	Female No. of cases	% of female cases
Summer (March-June)	240	53.33	49	60.49	191	51.76
Rainy (July-October)	116	25.78	14	17.28	102	27.64
Winter (Nov.-December)	94	20.89	18	22.22	76	20.60
Total	450	100.00	81	18.00	369	82.00

The graphical representation of the above discussed data is shown here under

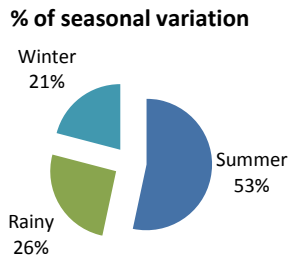

Figure1 Pie diagram Show Distribution of burn cases on the basis of seasonal variation with gender among study group (N=450).

Table 1 Distribution of **incidence** of burn autopsy

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 5 Distribution of burn cases on the basis of **seasonal variation** monthly among study group (N=450)

Months	2013 Total cases	% of total cases	Months	2014 Total cases	% of total cases
January	25	6.13	January	17	9.24
February	23	5.64	February	23	12.50
March	31	7.60	March	26	14.13
April	56	13.73	April	44	23.91
May	58	14.22	May	38	20.65
June	29	7.11	June	36	19.57
July	31	7.60		184	
August	33	8.09			
September	34	8.33			
October	29	7.11			
November	27	6.62			
December	32	7.84			
Total	408			592	

References

1. Ambade VN, Godbole HV, Study of burn deaths in Nagpur, Central India, Burns; Nov 2006, 32(7): 902-8.
2. Batra AK, Burn mortality: recent trends and sociocultural determinants in rural India, Burns; May 2003, 29(3): 270-5.
3. Dr. N. P. Zanjad et a; 2007; Study of Fatal Burn Cases in Medico- Legal Autopsies; JIAFM, 2007 29 (3); ISSN: 0971- 0973.
4. Dr. Sharanabasavappa Karaddi; Study of death due to thermal burns in and around Gulabarga city; Rajiv Gandhi health sciences; Karnataka, Bangalore; 2008.
5. Gupta M, Gupta O K, Yaduvanshi R K, Upadhyaya J. Burn epidemiology in the Pink city scene; Burns 1993; 22: 47–51.
6. Incidence at Dorland's Medical Dictionary
7. K. S. Narayan Reddy; The essential of forensic medicine and toxicology; 31st edition, K. Suguna Devi, pp: 296-306.
8. Narayan Reddy, K. S. The essential of forensic medicine and toxicology, 31st edition, K. Suguna Devi, pp: 131.
9. P. Krishnan , Q. Frew, A. Green, R. Martin, P. Dziewulski Cause of death and correlation with autopsy findings in burns patients , Accepted 26 September 2012; Published online 08 November 2012; pp: 1.
10. Rahul Chawla et al ;Original research paper A Two-year Burns Fatality Study; Indian Acad Forensic Med; 32(4);2004-2005; PP:292-296.
11. Richa Gupta et al; Profile of the Fatal Burn Deaths from the Varanasi Region, India; JCDR /2012/4179:0016; pp: 608-611.
12. Shankar Gowri, Naik Vijaya A,Rajesh Powar, Ravindra Honnungar, Mallapur M D; Epidemiology and Outcome of Burn Injuries ; J Indian Acad Forensic Med. October-December 2012, Vol. 34, PP:312-314.
13. Shinde A.B., Keoliya A.N.; Socio-demographic characteristics of burn deaths in rural India; www.ijhbr.com;International J. of Healthcare & Biomedical Research, Volume: 1, Issue: 3, April 2013, Pages 227-233.
14. Singh D., Singh A., Sharma AK, Sodhi L., Burn mortality in Chandigarh zone: 25 years autopsy experience from a tertiary care hospital of India, Burns; Mar 1998, 24(2): 150- 156.
15. Singh MV, Ganguli S.K, Aiyanna BM; A study of epidemiological aspects of burn injuries. Medical Journal of Armed Forces in India Oct 1996; 52(4): 229-32.
16. Smith JW, Aston SJ; Thermal and Electrical injuries; Grabb and Smith"s Plastic Surgery; 4th Ed. Boston: Little Brown. 1991: p. 675.
17. Subrahmanyam M., Epidemiology of burns in a district hospital in western India, Burns; Sep 1996, 22(6): 439-42.
18. Wikipedia, the free encyclopedia; en.wikipedia.org/wiki/Seasonality.
19. www.census2011.co.in › Uttar Prades.
20. www.yourdictionary.com › Dictionary.

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