

# Study of Dry Thermal Fatal Burn Prevalence with Occupational Work in Varanasi Area; India

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**Abstract:** Burns are one of the most devastating conditions encountered in medicine. The injury represents an assault on all aspects of the patient, from the physical to the psychological. In India, about 700,000 to 800,000 people per year sustain significant burns, though very few are looked after in specialist burn units. The aim of study to find out how dry thermal burn affect occupational status of victim among study group and its medico legal consequence and to height light problem regarding dry thermal burn affect occupational status of victim. Material for present retrospective study comprises 450 fatal cases of death due to burn of both sex of different age group brought to the mortuary of the Department of Forensic Medicine, Institute of Medical Science, Banaras Hindu University Varanasi, India during the study period from 01-01-2013 to 30-06-2014 taken randomly for medico legal postmortem examination from various police stations of Varanasi and surrounding regions. Show that most of the victims were housewives 67.11% followed by students 11.33% and house related work victims include 5.11%, Business and labor include each 3.11%.

**Keywords:** Burn Death, Occupational Burn, Forensic Medicine, Dowry Death, Unnatural death.

## 1. Introduction

Burns are one of the most devastating conditions encountered in medicine. The injury represents an assault on all aspects of the patient, from the physical to the psychological. It affects all ages, from babies to elderly people, and is a problem in both the developed and developing world. All of us have experienced the severe pain that even a small burn can bring. However the pain and distress caused by a large burn are not limited to the immediate event. The visible physical and the invisible psychological scars are long lasting and often lead to chronic disability. Burn injuries represent a diverse and varied challenge to medical and paramedical staff. Along with water (jal), air (vayu), earth (prithvi), fire (Agni) is perceived as one of the four basic components of universe [1]. Burns are also a major problem in the developing world. Over two million burn injuries are thought to occur each year in India (population 500 million). [2]. Fire was perhaps man's first double-edged sword, evidenced throughout history; it has served as well as destroyed mankind [3]. 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 [4]. Mammalian tissue can survive only within a relatively narrow range of temperature 22-44 °C [5].

In India, about 700,000 to 800,000 people per year sustain significant burns, though very few are looked after in specialist burn units [6]. The highest rates occur in women 16-35 years of age. Part of this high rate is related to unsafe kitchens and loose-fitting clothing typical to India [6]. It is estimated that one-third of all burns in India are due to clothing catching fire from open flames. Intentional burns are also a common cause and occur at high rates in young women, secondary to domestic violence and self-harm [7].

Fatal burns are defined as burn to disrespect or "burn" someone so badly that there is no way they can come back with any kind of legitimate response [8]. 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 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. Major burn injury is one of the most devastating forms of injury a person can sustain. Lives continue to be lost due to burn injuries despite improved patient care with early skin grafting, meticulous fluid resuscitation, and advanced antibiotic therapy [9].

According to the 2011 census Varanasi district has a population of 3,682,194 [10]. This gives it a ranking of 75th in India (out of a total of 640). The district has a population density of 2,399 inhabitants per square kilometre (6,210/sq mi). Its population growth rate over the decade 2001-2011 was 17.32%. Varanasi has a sex ratio of 909 females for every 1000 males, and a literacy rate of 77.05% [10].

## 2. Aim of the Study

- To find out how dry thermal burn affect occupational status of victim among study group and its medico legal consequence.
- To height light problem regarding dry thermal burn affect occupational status of victim.

## 3. Material and Methods

Material for present retrospective study comprises 450 fatal cases of death due to burn of both sex of different age group brought to the mortuary of the Department of Forensic

Medicine, Institute of Medical Science, Banaras Hindu University Varanasi, India during the study period from 01-01-2013 to 30-06-2014 taken randomly for medico legal postmortem examination from various police stations of Varanasi and surrounding regions. This total of 450 cases autopsied were studied to find out the history of the cases, their epidemiological features, medico legal aspects and their nature of burn injuries in an effort to understand the dynamics surrounding deaths. The data of the material collected for the study was filled in the schedule Performa sheet.

#### 4. Observation and Result

The present study of dry thermal fatal burn prevalence with occupational work in varanasi area India was undertaken from 1 January 2013 to 30 June 2014, during this period a total of 3149 medico legal autopsy were performed in the department of forensic medicine, institute of medical sciences, Banaras Hindu University. The observations and results of the present study have been elaborated with the support of tables, graph and photographs under following:

**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 (= N) i.e. 14.29%, which forms a considerable bulk and draws attention to the grievousness of this problem.

**Table 2:** Show that most of the victims were housewives 67.11% followed by students 11.33% and house related work victims include 5.11%, Business and labor include each 3.11%.

#### 5. Discussion

The present study of dry thermal fatal burn prevalence with occupational work in varanasi area India, provides a detailed overview of fatal burns. It reveals pre-hospital demographic parameters affecting mortality. Further, it gives a comprehensive description of causes of death after burn trauma. We also identified some clinically important diagnoses missed during treatment.

##### 1. 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 [11] 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 [12] 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 [13] (23.3%), [14]

(21.6%) and [15] (10.79%)]. 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 [11,12].

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 [16, 17].

#### 2. Occupational variation

Table 4.A.9: In present study it was observed that most of the victims were housewives 67.11% followed by students 11.33% and house related work victims include 5.11%, Business and labor include each 3.11%. Other study finds that housewives predominated comprising of 56% cases, 6% cases of laborers and 4% cases were students [18]. The present study was in consistence with studies of above mentioned authors due to involvement of females in the kitchen related work and Dhibri lamp (local lamp) or Deep Laltarn lightning.

#### 6. Acknowledgement

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#### 7. Conflict of Interest

Nil

#### 8. Source of Funding

This research was not financially supported by any funding agencies.

#### 9. Ethical Clearance

The present study was approved by "Institutional Ethical Committee" of department of Forensic Medicine S.S.Subharti medical college Dehradun. All the information has been taken under consideration of medical ethical committee.

#### 10. Conclusion

In India, as long as the problem of married female deaths by burning persists, the government needs to concentrate in this direction and the NGOs, Social groups, and workers need to put in more sincere efforts. Fundamental dictum being "prevention is better than cure", most of the burn incidence are preventable and should be prevented or at least reduced by drastic and combined efforts of all concerned.

- Educating the people about safety measures through various programmes, television, radio, newspaper, warning label or cautionary information 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.
- For cooking like domestic liquefied petroleum gas (LPG) and solar cooker.
- Discouraging the use of kerosene burner and other open burner to reduce the incidence of burns fatality.
- Greater emphasis must be placed on the provision of guard around the open burner in the kitchen and improvement in the design of cooking unit.
- Similarly replacing the kerosene lamp with torch, emergency lamps, inverters, and other batteries.
- Using clothes or garments, which are of non-inflammable material during exposure to fire?
- Fabrics, which are highly inflammable and loose, need to be avoided especially when working in the kitchen.
- Educating the women about the inflammatory nature of the fabrics and tucking in the sari properly without overflowing loose ends.
- Undoubtedly, a burn is a terrible and painful form of trauma and prevention is of paramount importance. Prevention depends on many factors; the economic development of society, the level of education, the presence of protective legislation, both at home and in the workplace. It is also a function of information; data implemented as knowledge, can be used as a tool to persuade and argue for more controls and more legislation. No matter how effective preventive campaigns are, burns will tragically always occur. It is important therefore to publicize and practice as much as possible the appropriate first aid for burns.
- As this problem of thermal deaths persists in our country, the government along with various working groups and bodies need to come together with more sincere efforts so as to minimize burn mortality and also to prevent and reduce their incidence.

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## Tables and Graph

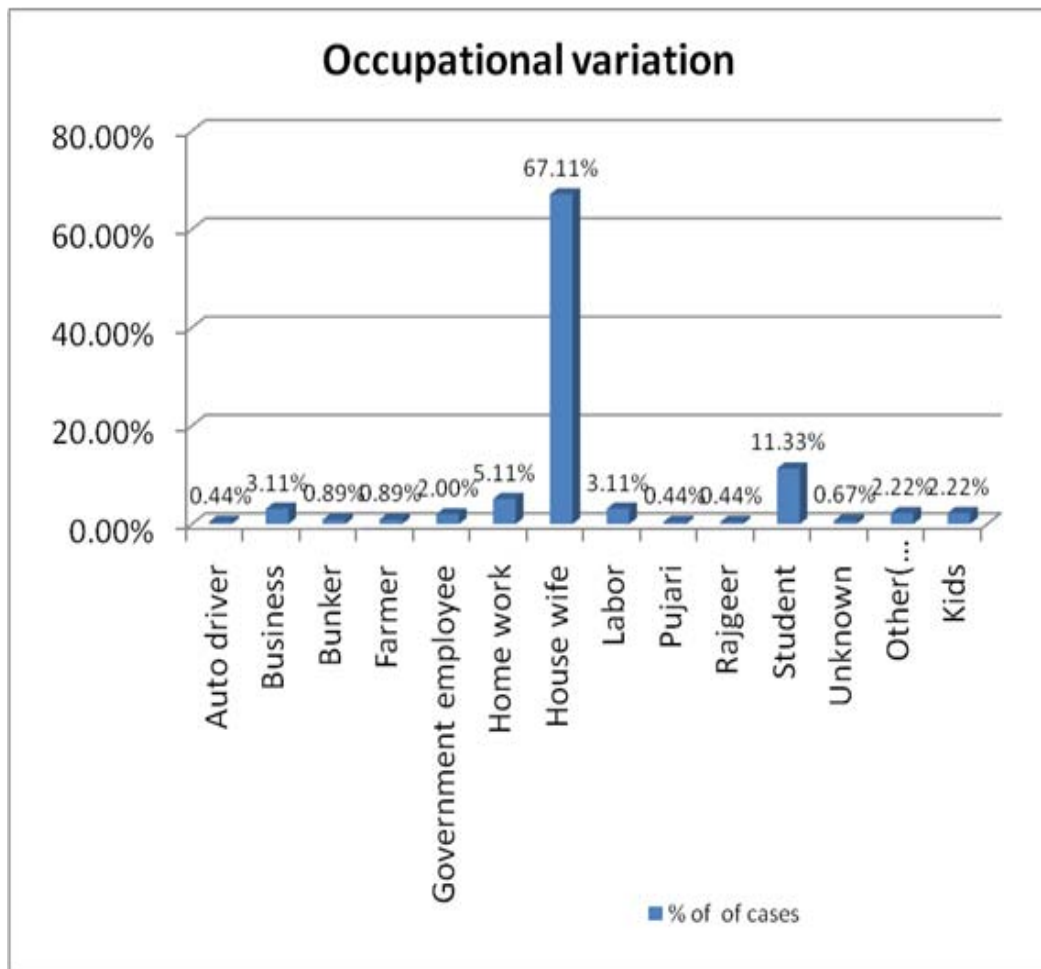
**Table1:** Distribution of incidence of burn autopsy cases during the study period from 1 January 2013 to 30 June 2014:

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 on the basis of occupational status of victim among study group (N=150):

S. No.	Occupational status of victim	Total No. of cases	% of total cases
1.	Auto driver	2	0.44
2.	Business	14	3.11
3.	Bunker (Weaver)	4	0.89
4.	Farmer	4	0.89
5.	Government employee	9	2.00
6.	Home related work	23	5.11
7.	House wife	302	67.11
8.	Labor	14	3.11
9.	Pujari	2	0.44
10.	Rajgeer	2	0.44
11.	Student	51	11.33
12.	Unknown	3	0.67
13.	Other (Bhuja, Electrician, Bed ridden, Rickshaw puller, Social worker,)	10	2.22
14.	Preschool children's	10	2.22
	Total	450	100.00

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



**Figure:** Column diagram shows that distribution of burn cases on the basis of occupational status of victim among study group (N=150).