

ORIGINAL ARTICLE

Analytical Study of Deaths Due to Suicidal Burns Based on Postmortem Examination**D Laxmi,¹ G Mahender,² A Shirisha,³ B Ravi Kumar.⁴**Assistant Professor,^{1,4} Associate Professor,² Senior Resident.³

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Abstract:

Heat is a form of energy which when transferred to the body causes thermal injury in the form of burns or scalds, the former due to dry heat and the latter due to moist heat. According to WHO, an estimated 1,80,000 deaths every year are caused by burns, the vast majority occur in low/middle-income countries and almost two-thirds occur in African and South-East Asia regions. According to World Health Statistics 2019, India's suicide rate stood at 17.8 suicides per 1,00,000 people, much higher than the global suicide rate of 10.5. The present study focuses on suicidal deaths due to burns to know the magnitude of the problem in our society, to identify which group of society is more vulnerable to this method of suicide and to investigate the outcome of self-inflicted burns and what measures can be taken to reduce the count. An observational study of 100 postmortem cases conducted during a period of 18 months i.e. from January 2019 to June 2020 conducted in Gandhi Medical College/hospital mortuary, Secunderabad, Telangana. The main sources of data are inquest reports, first investigation reports, postmortem reports, hospital case sheets, and death summaries (in treated cases and hospital deaths). The present study concluded that maximum deaths due to suicidal burns occurred in the age group of 31-40 years (35%) associated with equal preponderance of male (50%) and female (50%) groups. Victims whose total body surface area involved was less survived better. By providing proper timely counseling to the vulnerable population, the rate of suicides can be curbed to some extent. Also creating public awareness about the adverse effects of chronic alcoholism, if not all, few social problems can be avoided. As the rural population's preponderance is more in deaths due to suicidal burns, most of them succumb by the time they reach the hospital or health care centers. The delay in hospitalization enhances the complications of burn injuries. Providing adequate health care facilities, counseling centers for the vulnerable section of population and expansion of tertiary medical care all over the country to treat burns victims could be a major step to prevent deaths due to suicidal burns.

Keywords: Suicide; Burns; Degree of burns; Socioeconomic status; Period of survival; Total body surface area; Self-immolation; Kerosene; Soot.

Introduction:

“FIRE”, as a noun, comes from the English “fyr” and the Greek “Pyr”. Though the existence of fire in nature in the form of lightning, volcanoes, etc has been since times unknown, we human beings tend to say that fire was invented by Homo erectus some 1,000,000 years ago.

This concept has wide scholarly support. Fire is an element of nature which is also worshipped in various cultures according to different mythological stories. Heat is a form of energy which, when transferred to the body causes thermal injury in the form of burns or scalds, the former due to dry heat and the latter due to moist heat. According to WHO, an estimated 1,80,000 deaths every year are caused by burns the vast majority occur in low/middle-income countries and almost two-thirds occur in African and South-East Asia regions. According to World Health Statistics 2019, India's suicide rate stood at 17.8 suicides per 1,00,000 people, much higher than the global suicide rate of

10.5.¹

Despite the advances in treatment modalities in medicine and surgical fields, the prognosis of burns cases is poor. This may also be attributed to the severity of burns, any other comorbid conditions, incompetency in treatment, poor hygiene, and nourishment. However, deaths due to self-immolation have been increasing over the years in our society.

The present study focuses on suicidal deaths due to burns to know the magnitude of the problem in our society, to identify which group of society is more vulnerable to this method of suicide, and to investigate the outcome of self-inflicted burns and what measures can be taken to reduce the count.

Methods and methodology:

The present study aims to study the socio-demographic pattern and precipitating events causing deaths due to suicidal burns, to identify the proportion of the percentage of burns to mortality, and to identify the areas of intervention to prevent such deaths.

An observational study of 100 postmortem cases was conducted during a period of 18 months i.e. from January 2019 to June 2020 in Gandhi Medical College/hospital mortuary, Secunderabad, Telangana. The main sources of data are inquest reports, first investigation reports, postmortem reports, hospital case sheets, and death summaries (in treated cases and hospital deaths).

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Results and Discussion:

Burns are one of the most devastating injuries a person can sustain. It affects all age groups, from babies to the elderly, and is a problem in both the developed and developing world. The injury represents an assault on all aspects of the patient, from physical to psychological. All of us have experienced the severe pain that even a small burn can bring. Though fire has become one of the most useful agents, it has proved to be one of the most destructive enemies of man.

The present dissertation focuses on deaths due to suicidal burns during the stipulated time period i.e., January 2019 to June 2020 in a sample size of 100 cases that were autopsied at Gandhi hospital mortuary. It reveals that:

1. Maximum cases of deaths due to suicidal burns occurred in the age group of 31-40 years (35%) followed by 21-30 years (33%) and 41-50 years.
2. The present study revealed male to female equal preponderance (males 50% and females 50%). The present study indicates the increasing tendency of suicides in males owing to several factors like the increasing mental strength of females, their individuality, and independence. However, I agree that a study of a larger sample size may affect this opinion.

Dalbir Singh et al. (1998)² in their analysis of autopsy records of 240 burn victims admitted to Nehru Hospital of Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh during the period of November 1996 to November 1998 reveals that the majority of burn deaths occurred in the productive age group of 15-40 years (83%) with peak incidence at 21-30 years (43%). Female preponderance (65%) was observed in all age groups. 64% of burn cases are from urban areas. Kerosene was the most common factor in burns death (82%). The majority of the females sustained burns during the daytime in contrast to the males who sustained burns at night. In women, the incidence of burn deaths was higher (73%) in those living with their families, most of the female victims were housewives (65.7%). The majority of deaths due to burns occurred within one week (65%) of the incidence, septicaemia was the major cause of death (53%).

3. Regarding marital status, maximum cases belong to the married category (81%), followed by unmarried (15%) and widowed (3%) cases.

Dhattarwal SK (1997)³ analyzed medicolegal deaths and 1154 postmortems during the year 1992 occurring at Pandit BD Sharma, PGIMS, Rohtak, where serious medicolegal cases from all over Haryana state are referred and admitted. In the maximum number of cases, burns as a cause of death especially in young females outnumbered other causes of suicide. Accidental cases were 471, suicidal 227, and homicidal 81. In August, there was the highest incidence of cases (49 in number).

Piyush T et al. (2017)⁴ in their cross-sectional study on deaths of married women due to burns revealed 37% were between 21-30 years age group, 95% were hindus, 51% were educated upto or below 10th standard, 75% were of low socio-economic status. Apte JS et al (1999)⁵ in a prospective study of consecutive

admissions to the burns unit have a majority of the patients below the age of 35 years. Females outnumbered males.

4. Majority of the victims were labourers (30% including agriculture laborers) followed by housewives (24%), farmers (7%), students (7%) and others (32%).

Malik AK et al. (2017)⁶ in their 2 years study revealed 65% victims were females and housewives constituted the largest population, amounting to nearly 54%.

5. Majority of the cases belong to the low socio-economic group (84%) followed by the middle socio-economic group (16%).
6. Majority of the victims were from rural areas (56%) and the remaining were from urban areas (44%). The present study shows that daily wage labourers, low socio-economic groups, and rural populations form a majority of those committing suicide by burns.

Due to financial problems faced by them, these groups are more vulnerable.

7. Majority of the cases occurred at home (96%).
8. Peak incidence of cases occurred in the winter season (43%) followed by summer (37%) and rainy season (20%).
9. Maximum number of incidents occurred between 6 pm-12 am (43%) and the least between 12 am-6 am (12%).
10. Majority of the cases were preceded by a fight/argument (55%) followed by a history of chronic illness (18%) and financial problems (11%).

The above points (9,10) support the fact that mostly low socio-economic category males in the Indian scenario tend to consume alcohol during the night and commit suicide in a rage of emotions during an argument or fight.

11. Maximum victims died due to the pouring of kerosene oil (84%) followed by petrol (12%) and others.

G.V. Perseley et al.⁷ revealed in their study on 1060 admissions to the burns unit, Royal Brisbane Hospital, over a 12-year period, there were 30 cases (2.8%) of attempted suicide. Fourteen (47%) of these patients died. The psychosocial features of people using self-ignition as a method of suicide are consistent with those of suicide in general. The morbidity is high and the outcome is often fatal, especially for those using a flammable liquid.

12. This study revealed that the total body surface area involved was 81-100% in maximum cases (44%).

13. 95% of the cases sustained dermo-epidermal burns.

14. All the 100 cases studied were suicidal burns showing signs of antemortem burning.

Tripathi CB et al. (2000)⁸ in the study of "Burns" observed 152 cases of medicolegal autopsies held in the mortuary of the Forensic Medicine Department, BHU, Varanasi from 13.06.1987 to 03.02.1989. Out of 152 cases, 70 (48.05%) died accidentally followed by 47 (30.92%) homicidally and 32 (21.05%) committed suicide.

15. Death occurred in a majority of the cases in the hospital (97%), whereas 3% died on the spot.

16. Period of survival reveals that the majority of deaths occurred within 2 days to 1 week after the incident (48%).

O. Castana et al.(2013),⁹ studied the outcome of patients who committed suicide by burning which revealed majority had a psychiatric history, low socio-economic status, high TBSA percentage, high incidence of inhalation injury, prolonged hospital stay, increased need for surgery and high mortality rate. Their group of patients showed a slight female preponderance (55%) compared to most of the series reported (yet in accordance with the other retrospective study from Athens) and a slightly higher mean age (58 yr).

17. The presence of soot particles in airways was observed in 22% of cases, and in both GIT and airways in 6% of cases.

18. The below table suggests that victims who had a lesser percentage of TBSA burns survived for a greater period, whereas victims who had a greater percentage of burns either survived for a short period or died on the spot.

Out of 100 cases studied, 97% of cases were hospital deaths that received treatment and 3% died at the scene of the offense. Period of survival ranging between 12hrs-1month is seen in 86% of cases. Based on hospital records, the majority of the cases died due to septic shock.

Sachil Kumar et al. (2016)¹⁰ revealed that in all burn deaths among older adults, 41.6% of the victims were male and 58.4% were female with a male: female ratio of 1:1.4. Most common manner of death among the elderly was an accident (42.9%) followed by homicide (35.1%) and suicide (22%). Women in all three groups were more prone to the risk of burn deaths. Causative agents for the accidental deaths were fire in all cases while in suicidal and homicidal deaths the causative agents were sprinkling/pouring of kerosene. 54.7% of the suicidal victims had burns >70% TBSA (total body surface area).

Oren P. Mushin et al. (2019)¹¹ in their study revealed patients with self-inflicted burns have a higher rate of previous self-harm behavior, psychiatric co-morbidities and substance abuse. Self-inflicted burns lead to longer stay in the hospital and ICU and a higher need for excision and grafting compared to non-intentional burn. Among the self-inflicted burn group, 55% of patients were on psychiatric medication and 59% had a previous psychiatric admission. Increased counseling of at-risk populations may help to decrease this potentially preventable method of injury.

Chaudhary BL et al. (2013)¹² in their 5 years (1st January 2006 to 31st December 2010) autopsy-based retrospective study of 2773 burns cases 56.52% were males and 43.47% were females; 72.94% were accidental followed by suicidal 17.39% and homicidal 9.66%.

Conclusion:

The present dissertation concludes that deaths due to burns are forming a major proportion of the increasing suicidal death rate in our country. Today there is ascending incidence of suicides among all age groups without any gender preponderance due to multiple reasons.

When it comes to the point of suicide, a human being requires lot of courage to deliberately harm himself. Hence, most of the times people resort to methods which are less painful like consumption of pesticides, ingestion/injection of harmful drugs, hanging, incising the wrists, using firearms (contact shots), etc. If one has chosen the most painful method of setting him/herself ablaze, the amount of mental agony in their life can be estimated. Predominantly, suicides are committed under the influence of alcohol or in an emotionally disturbed state of mind. Several incidents proved that persons committing suicide have some triggering factors like financial problems, marital issues, problems related to education, career, and love life; as a part of public protests, depressive illnesses; loss of near and dear ones, etc. Suicidal burns are also seen in cases of dowry harassment and torture by in-laws, bad care to the females, illiteracy, quarrels for the property among siblings, psychics and sometimes failing in examinations by means of pouring kerosene on the body; setting ablaze themselves.

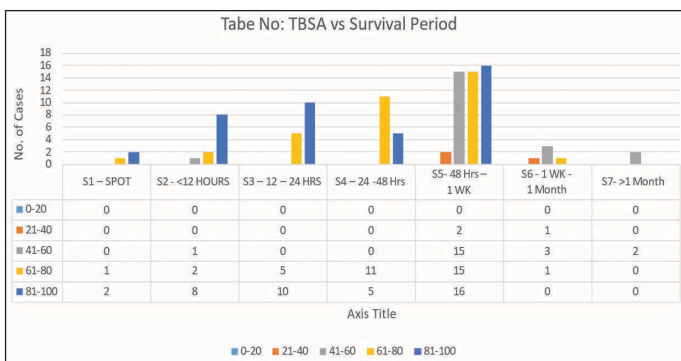
As India is a developing country, the majority of the population is low and middle socio-economic groups. Though their financial condition is a triggering factor for suicide, I would like to stress a strange point i.e. easy availability of the accelerant kerosene to the victims. Kerosene, which is given by the government as a part of a ration to the lower socio-economic families or purchased from outside, is the prime source of burns in my study. Whenever there is a dispute in the house, kerosene is easily available in the premises which is used for self-immolation by the victims.

If the victim attempts self-immolation in an open space other than a closed room, there is a possibility of hospitalizing the victim at the earliest. This increases the period as well as the chances of survival.

Females, especially during the premenstrual phase, postpartum phase and menopause suffer from depressive thoughts during which even a petty quarrel at home might push them towards suicide by self-immolation. People suffering from chronic illnesses and depressive disorders with a history of antipsychotic or antidepressant drug therapy have shown suicidal tendencies to a greater extent.

The victims mostly die due to septic shock, neurogenic shock or hypovolemic shock. The survival rate for burn victims is not satisfactory despite great medical advancement.

By providing proper timely counseling to the vulnerable population, the rate of suicides can be curbed to some extent. Also creating public awareness about the adverse effects of chronic



alcoholism, if not all, few social problems can be avoided. As the rural populations' preponderance is more in deaths due to suicidal burns, most of them succumb by the time they reach the hospital or health care centers. The delay in hospitalization enhances the complications of burn injuries.

Providing adequate healthcare facilities, counseling centers for the vulnerable section of the population and expansion of tertiary medical care all over the country to treat burn victims could be major steps in preventing deaths due to suicidal burns.

Limitations: This study could not include histo-pathological examination of tissues and estimation of carbon monoxide levels in the blood of the deceased.

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Ethical clearance: Taken

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