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An autopsy study of burn cases

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Abstract

Background: The majority of fire related deaths are accidental and there is typically abundant collateral evidence. The present study was conducted to record burn deaths.

Materials & Methods: The present study was conducted on 68 deaths due to burns of both genders. An autopsy of bodies was done. Manner of deaths, presence of smell of kerosene and soot particles in trachea was assessed.

Results: Out of 68 patients, males were 12 and females were 56. Out of 68 deaths, 15 were accidental, 20 were suicidal and 33 were homicidal. The difference was significant ($P < 0.05$). In 54 cases, soot particles were present in trachea and in 60 cases, kerosene smell was present. The difference was significant ($P < 0.05$).

Conclusion: Authors found that most deaths were homicidal and presence of kerosene smell and soot in trachea was present.

Keywords: Burn, kerosene, smell

Introduction

Globally, there are about 300,000 deaths due to burns every year. Of these, 95% take place in developing countries with Southeast Asia recording nearly 57% of deaths due to burns. In India, every year 1000000 people are moderately or severely injured due to burn injury. The majority of fire related deaths are accidental and there is typically abundant collateral evidence, from police and fire brigade investigations, to exclude suicide or homicide. Deaths from burns are usually accidental but may be of suicidal or homicidal origin. Suicidal burning is relatively uncommon^[1].

Burn wounds can be classified into 6 separate groups based on the mechanism of injury: scalds, contact burns, fire, chemical, electrical, and radiation. Scald burn injuries can be caused by liquids, grease, or steam. Liquid scalds can be further divided into spill and immersion scalds. Fire burn injuries can be divided into flash and flame burns. The mechanism of burn injury can be used as a predictor of outcome. For example, patients with flame burns and electrical burn injuries often require hospitalization. In contrast, most patients with burns caused either by contact with hot surfaces or sun exposure are managed as outpatients^[2].

It is not unusual for murderer to try to dispose of the body of the victim by fire to conceal crime. At times, some people may cause burn injuries on a dead body and then produce it before the police to support a false charge of murder against his adversary. In both the cases, care should be taken to distinguish between ante mortem and postmortem burns to show that victim was or was not alive at the time of fire^[3]. The present study was conducted to record burn deaths.

Materials & Methods

The present study was conducted in the department of Forensic Medicine. It comprised of 68 deaths due to burns of both genders. Ethical clearance was taken prior to the study.

General information such as name, age, gender etc. was recorded. An autopsy of bodies was done. Manner of deaths, presence of smell of kerosene and soot particles in trachea was assessed. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

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Results

Table I: Distribution of patients

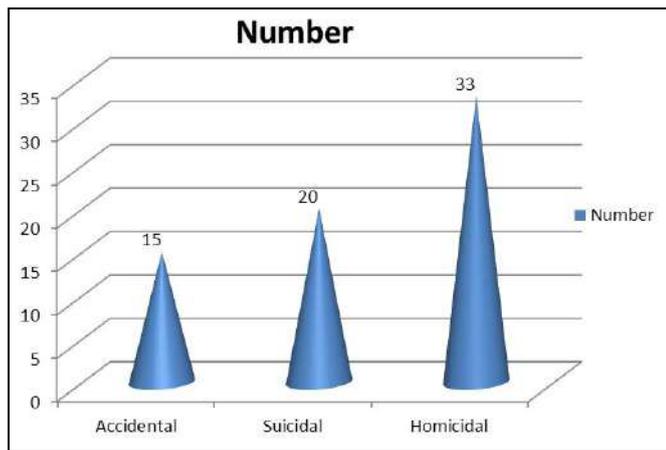
| Total- 68 | | |
|-----------|-------|---------|
| Gender | Males | Females |
| Number | 12 | 56 |

Table I, graph I shows that out of 68 patients, males were 12 and females were 56.

Table II: Manner of deaths

| Manner | Number | P value |
|------------|--------|---------|
| Accidental | 15 | 0.01 |
| Suicidal | 20 | |
| Homicidal | 33 | |

Table II, graph shows that out of 68 deaths, 15 were accidental, 20 were suicidal and 33 were homicidal. The difference was significant ($P < 0.05$).



Graph I: Manner of deaths

Table III: Other parameters

| Parameters | Number | P value |
|------------------------------|--------|---------|
| Soot particle in trachea Yes | 54 | 0.02 |
| No | 14 | |
| Kerosene smell Yes | 60 | 0.001 |
| No | 8 | |

Table III shows that in 54 cases, soot particles were present in trachea and in 60 cases, kerosene smell was present. The difference was significant ($P < 0.05$).

Discussion

The issue of burns has always been a significant cause of morbidity and mortality in both developing and developed countries around the world and a major cause of global public health crises [4]. As per the World Health Organization, burns account for an estimated 300,000 deaths annually, majority (>95%) of which occur in developing countries, with the Southeast Asia region contributing to 57% of the deaths [5]. Extrapolated data from major hospitals indicate that about 7 million burn incidents occur in India each year, making burn injuries the second largest group of injuries after road accidents. A significant proportion of these cases are contributed by thermal burns [6].

The survival rate of the patients with burns in India is approximately 50% for burns involving <40% of the total body surface area (TBSA). Among the patients who survive, the recovery is slow, painful and never complete [7]. The short-term and long-term sequelae of such injuries can be

disabling, causing sub-optimal functioning of the patient. It may also leave a deleterious mark on the psyche of the patient, who would have to subsequently undergo multiple reconstructive surgeries to restore both form and function [8]. The present study was conducted to record burn deaths.

We found that out of 68 patients, males were 12 and females were 56. Danaf *et al.* [9] found that there are 144 patients included in the study. The mean age of patients was 28 years (SD=14.7 years) and overall male to female ratio was 0.6. The percent of Total body surface area for burned patients ranged between 1% and 100% and maximum number of patients were admitted with 30 to 50% burns (27.5%) The median hospital stay was 5 days. There was a significant association between Total body surface area burns and hospital stay ($P < 0.001$). 7.3% patients were discharged from the hospital after successful treatment. 54.51% deaths were recorded. Death rate was higher amongst females as compared to males. Mortality rate was highest in age group of 12–26 years. There was a significant correlation between Total body surface area burns and mortality ($P < 0.001$). Death rate was highest amongst patients with suicidal burns as compared to accidental and homicidal burns. 75% patients died within 5 days of hospitalization.

We found that out of 68 deaths, 15 were accidental, 20 were suicidal and 33 were homicidal. In 54 cases, soot particles were present in trachea and in 60 cases, kerosene smell was present. Singh *et al.* [10] found that a total number of 120 cases of burn injuries were taken; of which 88 patients died and a detailed post mortem examination was conducted. Out of total 88 autopsies, 21 (23.86%) cases were magistrate inquest and rest 67 (76.13%) were police inquest. Manner of burn was accidental in nature in majority i.e. in 113 (94.17%) cases, followed by suicidal in 7 (5.83%) cases. Out of total 7 suicidal cases, dying declaration was recorded in 5 cases. Of all autopsied cases carbon soot particles were found in only 5 cases (5.69%). Present study is an effort in highlighting the medicolegal importance of thermal burns. The government should come forward with strict laws and monitoring should be done for strict implementation of the Anti-dowry Act would go a long way in bringing down the incidence of these ‘accidents’.

Conclusion

Authors found that most deaths were homicidal and presence of kerosene smell and soot in trachea was present.

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