



STUDY ON PREVALENCE AND RESPONSIBLE FACTORS FOR THERMAL BURN

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Abstract:

Health-related injuries can have a significant impact on quality of life, including changes in physical, social and mental status of people. Hence due to serious concerns about the burn injuries present study was planned in the north Indian hospital to evaluate its causes. Because of the importance of burns and given the demographic, social, economic and cultural structure in each region, the acquisition of specific information in each region is essential for prevention planning and treatment.

Total 50 burn patients referred to Department of Burn and plastic surgery Patna Medical College from Dec 2017 to Aug 2018 were enrolled in the present study. The data was collected on the basis of age, gender, percentage of burn in terms of body Data collected was entered into a standard proforma prepared for this study and were analysed. On the basis of analysis and observation, results were drawn and discussed and compared with other relevant literatures.

Due to the high burn rate in the province the findings can be taken into consideration by the authorities to take preventive measures, both in terms of improving the living and working environment and teaching the existing risks and methods Facing these hazards to reduce the physical, psychological and social consequences of these disastrous events. It is necessary to prevent the occurrence of further events in this field in the future by taking necessary measures and conducting further studies with a wider dimension.

Keywords: Thermal burn, epidemiology, burn injury, etc.

INTRODUCTION:

A thermal burn is a type of burn resulting from making contact with heated objects, such as boiling water, steam, hot cooking oil, fire, and hot objects. Scalds are the most common type

of thermal burn suffered by children, but for adults thermal burns are most commonly caused by fire.[1] Burns are generally classified from first degree up to fourth degree, but the American Burn Association (ABA) has categorized thermal burns as minor, moderate,

and major, based almost solely on the depth and size of the burn.[2]

There are three (or sometimes four) degrees of burns, in ascending order of severity and depth. According to Jackson's thermal wound theory, there are three zones of major burn injury.

- Zone of coagulation is the area that sustained maximum damage from the heat source. Proteins become denaturated, and cell death is imminent due to destruction of blood vessels, resulting in ischemia to the area. Injury at this area is irreversible (coagulative necrosis & gangrene)
- Zone of stasis surrounds the coagulation area, where tissue is potentially salvageable. This is the main area of focus when treating burn injuries.
- Zone of hyperemia is the area surrounding the zone of stasis. Perfusion is adequate due to patent blood vessels, and erythema occurs due to diapedesis[3]

There are skin factors that offer resistance to burns. A person who is more burn resistant would require higher temperature and longer exposure to burn as badly than a less resistant person. Thicker skin would offer more insulation from heat. External factors on the skin like hair, moisture or oils can also help ease and delay the burn. Another factor is skin circulation, which is used to dissipate heat imprinted on the skin.[4]

Scalding is a type of thermal burn caused by boiling water and steam, commonly suffered by children. Scalds are commonly caused by accidental spilling of hot liquids, having water temperature too high for baths and showers, steam from boiling water or heated food, or getting splattered by hot cooking oil. Scalding is usually a first- or second-degree burn, and third-degree burn can sometimes result from prolonged contact. Nearly three quarters of all burn injuries suffered by young children is scalding.[5]

Fire causes about 50% of all cases of thermal burns in the United States. The most frequent event where people get burned by fire is during house fires encountered by firefighters and

trapped occupants, where 85% of all fire deaths take place. Fireworks are another notable cause of fire burns, especially by adolescent males on Independence Days. The most common cause of injury by fire or flame by children is touching candle flame. In some regions, such as the western United States, getting burned by wildfires are common, especially by firefighters who are trying to fight forest fires. Wildfires can suddenly shift due to changing wind directions, making it harder for firefighters and eyewitnesses to avoid getting burned [6].

If clothing the person wears catches fire, third-degree burn can develop in the matter of just few seconds. Solid objects that are hot can also cause contact burns, especially by children who intentionally touch things that they are unaware are too hot to touch. Such burns imprinted on the skin usually form a pattern that resembles the object. Sources of burns from solid objects include ashes and coal, irons, soldering equipment, frying pans and pots, oven containers, light bulbs, and exhaust pipes.[7]

Education is an important tool for children on how to prevent getting burned by fire or getting scalded. In that act, firefighters and community leaders are often employed in schools and clinics. Smoke alarms installed in homes are used to reduce deaths resulting from fire by half. Homeowners should change batteries at least once a year and replace smoke alarms every decade. Before fire occurs, a family should practice evacuating home, and when fire occurs the family must leave the residence immediately (within two minutes). To prevent house fires, a family should keep flammable objects, like matches, out of children's reach, and they must not leave anything involving flames unattended while keeping objects that can catch fire away from it by at least 12 inches, like stove ovens, stovetops, space heaters, and candles. Fire extinguishers should be stored in the kitchen, where most house fires start.[8]

To prevent children from getting burned, water temperature must not be set too high when taking baths or washing hands, nonflammable sleepwear should be worn, backburners should

be used when cooking something on the stove, and hot foods, drinks, and irons should be kept away from the edge of counter and table. Oven mitts and potholders must be used in handling hot containers. People should be careful when taking hot foods out of microwave ovens, and covers should be opened gently to reduce the risk of steam burns.[9]

Because of the importance of burns and given the demographic, social, economic and cultural structure in each region, the acquisition of specific information in each region is essential for prevention planning and treatment. Burns from many directions are among the worst tragedies a person may experience and causes death, disability, pain, physical, mental, economic and disability problems. Therefore, for accurate planning and success in preventing illness and reducing its complications, it is necessary to have accurate information on burn epidemiology.[10]

Health-related injuries can have a significant impact on quality of life, including changes in physical, social and mental status of people.[11] Hence due to serious concerns about the burn injuries present study was planned in the north Indian hospital to evaluate its causes.

Methodology:

Total 50 burn patients referred to Department of Burn and plastic surgery Patna Medical

College From Dec 2017 to Aug 2018 were enrolled in the present study. The data was collected on the basis of age, gender, percentage of burn in terms of body Data collected was entered into a standard Performa prepared for this study and were analysed. On the basis of analysis and observation, results were drawn and discussed and compared with other relevant literatures.

The approval of the institutional ethics committee was taken before starting the study. All the patients and their parents were informed consents. The aim and the objective of the present study were conveyed to them.

Following was the inclusion and exclusion criteria of the study:

Inclusion criteria:

All patients, regardless of age & gender, presented with burn injury and requiring admission were included.

Exclusion criteria:

Patients with minor burn injury treated on OPD (outpatient department) basis. Patients who had taken discharge against medical advice and those declared absconded. Patients not willing to enroll in the study.

Results & Discussion:

The data from 50 patients suffered from the burns were collected and presented as below.

Table 1: Demographic data of study patients.

Parameter		No. of Cases
Sex	Male	20
	Female	30
Residenceplace	Rural	40
	Urban	10
Maritalstatus	Single	14
	Married	36

Table 2: Distribution of patients according to epidemiological variables.

Seasonalvariation	No. of cases
Summer	14
Rainy season	8
Winter	28
Place of burn	No. of cases

Home	42
Work	6
Others	2
Method of cooking	No. of cases
Floor cooking	40
Elevated cooking	10
Type of clothes at the time of burn	No. of cases
Cotton	12
Synthetic	26
Mixed	12
According to literacy	No. of cases
Literate	22
Illiterate	28
Occupation	No. of cases
House wives or Housemaids	18
Labourer	20
Businessman	2
Job	4
Students	4
Others	2
Socioeconomic status	No. of cases
Upper class	2
Upper middle class	2
Middle class	4
Lower middle class	4
Lower class	38
Type of Burn	
Thermal	42
Scalds	4
Electrical	2
Miscellaneous	2
Nature of burn	
Accidental	34
Suicidal	10
Homicidal	6

Females were more commonly involved in burn injury than males in our study with female to male ratio of 1.6:1. Similar observations indicating female predominance were reported by various other studies [12-13]. Female predominance may be because in our country cooking is considered as the primary responsibility of females so they are more commonly exposed to fire than males. Indian females wear loose fitting clothes like Sari, dupatta which can catch fire easily. The gender discrepancy may also be due to early marriages

of females in family which exposes them to social and family stress and marital disharmony.

Most of the burn victims (66%) in our study were from rural area and this finding is in accordance with the various other studies [14-15]. This could be attributed to low standard of living in rural people and related factors. Majority of burn patients in this study were from low socioeconomic status as per modified BG Prasad classification [16]. This findings was comparable with studies conducted by

Singh D et al [17]. In this study most of the patients (57.8%) were illiterate and illiteracy was higher in females than in males. These findings are in accordance with the studies conducted by Singh MV et al. and Attia AF et al [18-19]. This clearly indicates that educational level has definite impact on the incidence of burn.

Most of the victims in the present study were labourers followed by housewives. Similar observations have been made in the study conducted by Darshan BB et al [20]. Majority of patients sustained burns at homes in this study. This is in accordance with the various other national studies and international studies [21].

Flame was the commonest cause of burn noted in our study. Similar findings were reported in various other studies conducted in developing countries [22]. High incidence of flame burn was explained by the fact that in villages kerosene stove, kerosene lamps, Chullha, Shegadi are commonly used for cooking. Kerosene is commonly used in rural area as domestic fuel as it is cheap and easily accessible. As far as nature of burn is concerned majority of burns 73.4% were accidental. This finding is in accordance with other studies[23]. Least common nature of burn is homicidal. Homicidal burns are also common in newly married female but in many cases the actual nature of burn is not disclosed by the patient either due to pressure or emotional blackmailing by in-laws or relatives.

Conclusion:

Due to the high burn rate in the province the findings can be taken into consideration by the authorities to take preventive measures, both in terms of improving the living and working environment and teaching the existing risks and methods Facing these hazards to reduce the physical, psychological and social consequences of these disastrous events. It is necessary to prevent the occurrence of further events in this field in the future by taking necessary measures and conducting further studies with a wider dimension.

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