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Original Research Article

Analysis of Incidence, Etiology and Risk Factors Associated in Acute Burn Injury in Adults

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Abstract:

Background: Due to the high rates of morbidity, disability, and mortality among young and middle-aged persons, burn injuries are a serious health concern. Social issues are also connected to burn damage. It could have unintentional, homicidal, or suicide reasons. There isn't much study on burn injuries in India, despite the clinical and societal importance of burn injuries. Thus, we made an effort to draw attention to our findings in this study, which was conducted to determine the etiology of burns, their clinical characteristics, and the prognosis for burn patients treated at our Institute.

Methods: From July 2020 to December 2020, this observational study of burn injury patients admitted to the surgery wards and burn ICU at Katihar Medical College & Hospital, Katihar, Bihar, was carried out. We examined 226 burn patients who were hospitalized to our institute's general surgery units and burn ICU. Both sexes and burn patients over the age of 18 were included in the study.

Results: Burn injuries were present in 226 patients in total. 64 women and 162 men, or a M:F ratio of 2.53:1.Compared to females, men (71.68%) were more commonly impacted. In this study, the majority of the burn victims were between the ages of 21 and 30.i.e.42.02%. Patients between the ages of 50 and 75 were less numerous. Regarding the causes, it is evident that the majority of instances occur during household tasks, with electricity accounting for the second-highest number of cases (26.99%). Suicidal thoughts are less common (3.53), and seven cases have an unclear etiology.

Conclusion: Although preventing burn injuries is a very challenging endeavor, it is necessary to reduce the high morbidity and death that accompany a burn injury. We must take all necessary steps to limit its occurrence. The prevalence of burn injuries in India can only be reduced by social workers, medical and paramedical staff, and administrators taking a coordinated and committed approach.

Keywords: preventive measures, incidence, causes, types of burn, house hold activities.

Introduction

Burn injuries can have a severe impact on a patient's emotional health and quality of life. According to the World Health Organization, burns caused by fire kill more than 300,000 people each year. The World Health Organization (WHO) has also categorized burn injuries brought on by exposure to corrosive compounds as well as fire, flames, smoke, hot substances, electric current, and lightning. The worldwide illness burden continues to be significantly impacted by burn injuries. They are responsible for about 310,000 unintentional fire-related deaths each year, most of which are in youngsters and young people. In low- and middle-income nations, the incidence rate is 1.3, while in high-income ones; it is 0.14 per 100,000 people. More than 95% of fatal burn injuries take place in developing nations.

Burns account for 40% of all unintended home-related injuries, according to recent studies on injuries, making them one of the main causes. These burn injuries have been recorded often in females. A person's lifetime risk of developing burns is predicted to be 1%.

After taking into account all of these variables, a study was done with the aim of determining the sociodemographic characteristics of burn patients in India's northern area as well as the causes of burn injuries and how they affect patients who are admitted to our top hospital.

Material and Methods

This observational study was carried out on burn injury patients who were admitted to the general surgical wards and burn ICU at Katihar Medical College & Hospital, Katihar, Bihar, between July 2020 and December 2020. We have made an effort to highlight the significance of burn injury prevalence and its varied kinds in this study. Incidence patterns, risk factors, and to identify preventive strategies. 226 burn victims who were admitted to our institute's general surgical units were the subject of our study. Both sexes and burn patients over the age of 18 were included in the study.

Name, age, sex, location of incident, and injury-related data, such as the cause of burn injuries, the extent of the burn, the injured anatomical sites, and inhalation injury, were all recorded in the information gathered. Burn injuries can be caused by flame, scald, contact, electrical, or other types of burns. All patients received initial resuscitation using either Ringer's lactate or normal saline. The skin was then coated in silver sulphadiazine until re-epithelialization led to healing. Most trunk and extremity wounds were bandaged until the eschar separated, then the skin was transplanted.

Results

226 patients who were the subject of the study suffered burn wounds. There were 162 men and 64 women out of 226 totals, making up a M: F ratio of 2.53 to 1. In contrast to females, men (71.68%) were more frequently afflicted. 42.02% of the burn patients, or those between the ages of 21 and 30, were the majority. In the age range of 51 to 60 years, there were the fewest burn patients, or 4.47%. In Table 1, this distribution is shown.

Table 1: Distribution of cases with their age group in years

Age group	Male	% age	female	% age	Total	% age
< 20	26	11.50	13	5.75	39	17.25
21-30	75	33.18	20	8.84	95	42.02
31-40	29	12.83	12	5.30	41	18.13
41-50	18	7.96	9	3.98	27	11.94
51-60	7	3.09	3	1.38	10	4.47
> 60	7	3.09	7	3.09	14	6.18
All	162	71.68	64	28.31	226	100

Maximum patients have (81) 25-50% age of burns as per table 2. Least patients are seen in 50-75 percentage of burn.

Table 2: Distribution of cases with percentage of burn

% age of burn	Number of patients	% age
< 25	80	35.39
25-50	81	35.84
50-75	31	13.71
> 75	34	15.04
total	226	100

Many mishaps happened in the kitchen and at home. Kerosene pump stoves are frequently used for cooking. The most frequent mechanisms for these injuries were stove explosions following excessive pumping and fuel filling while the stove was operating. Injuries from gas cylinders have happened in both homes and workplaces.

Table 3: Distribution of case with their causes

Causes	No.	% age
House hold activities	121	53.53
Electric current	61	26.99
Work place	16	7.07
Suicidal	8	3.53
Hot liquid	13	5.75
unknown	7	3.09
	226	100

According to table number 3, 53.53% of the most severe burns were caused by domestic activities. The second-highest cause of instances (26.99%) is electricity, and only 3.53 percent of patients are suicidal. Seven patients had unidentified causes. These types of mishaps happened as a result of people forgetting to turn off the cylinder valve, using defective piping that leaked, and an explosion that followed lighting in a kitchen that was closed. Candles, hurricane lanterns, diyas (clay-baked earthen oil lamps), and oil lamps (or "kupi") were also at blame for a large number of burns. All accidents were the result of human error.

Regardless of the fuel or burners, scalding and flame burns happened in the kitchen.

Discussion

Burn injuries continue to rank among the top causes of death, morbidity, and long-term societal consequences in low- and middle-income nations despite enormous advances in medical research. According to the International Society for Burn Injuries (ISBI), a burn is a form of damage that affects several skin cell layers and can result from flames or contact burns from hot liquids. Burn injuries include those produced to the skin by electricity, chemicals, UV rays, radioactivity, smoke inhalation injuries that result in lung damage, and more.

Even though > 90% of burns are avoidable, they continue to be a serious public health issue. [7] Different communities and social groupings experience burn injuries in different ways and with distinct etiologies. However, the causes of injuries can be homicidal, suicidal, or accidental. The effects of burns can range from minor scalds and surface burns to deep organ damage, depending on their size, severity, and accessibility to medical care. The age range of 21 to 30 years had the highest percentage of patients (42.02%), indicating that this age range had the highest exposure to burn agents. The other earlier research' findings and these outcomes are in agreement.

According to the study by Attia AF et al. and Singh MV et al., 66% of the patients were in the 21–50 age range, which is the most productive in our nation and more prone to accidents at both home and work. Other studies conducted in India and elsewhere have a distribution of ages similar to this one. Even though burn injury prevention has improved recently, many people still get burn injuries every year. [9] Extremely serious deformity, disability, or even death can result from severe burns. [12] Similar to prior research; almost 80% of the patients were between the ages of 18 and 40. According to the current study, 59% of burn injury admissions were made by men, with a peak between the ages of 21 and 30 (33.18%) and 31 to 40 (12. 83%), respectively. Ahuja and Bhattacharya (2002), in contrast, noted a greater admission rate for women who had burns (58%). The danger of burn injuries varies greatly depending on gender, with more women than males typically suffering burn injuries in developing countries due to cooking and heating fires. Additionally, women in developing nations like India get married sooner than men in the family and are subjected to higher societal and familial stress. In line with earlier studies, this study found that 28.75% of patients had significant burn injuries involving more than 50% of body surface areas and 35.84% of patients had major burn injuries involving 25–50% of body surface areas.

According to Kumar's (2000) research, 37% of people who had burn injuries had >20% of their body surface area affected. In our study, 53.53% of patients had burns caused by household activities, while 26.7 % had injuries from electric current. Only 3.09% of patients had burns with an unclear etiology; some had a history of psychiatric illness. 7.07% of patients had burns sustained at their places of employment, such as factories or welding shops using LPG cylinders. 72% of patients in a research by Gupta A et al. suffered thermal burns, 7% scalds, and 17% electric burns. The second decade of life (33.3%) was the age group that was most commonly afflicted, according to a study done by Nnabuko REE et al. 43 of 84 cases (51%) involved contact with a live wire or contact with an item that had previously come into touch with a live wire (secondary contact). Injury incidents most frequently happened at home (51.2%).

Patients with severe burns may require lengthy hospital stays, many surgeries, and some need to be readmitted for reconstructive surgery. The psychological problems caused by severe burns can endure a lifetime and the physical deformities and suffering they cause have far-reaching effects. Burns are still common in developing countries due to the widespread use of hazardous fuel and stoves. The majority of burns involved kerosene and flame. This is most likely a result of their accessibility and widespread use as home fuels. Regarding the causes of burns, the majority of patients suffered unintentional burns, whereas 3.53% suffered suicidal burns and 5.75% experienced burns from hot liquids. Our findings support reported findings. Some girls conceal the real cause of their burns and instead attribute them to an accident. Patients may initially confess to having incurred unintentional burns due to peer pressure and worry. These medico legal considerations, however, are outside the purview of the current investigation. According to the findings of the current study, most burn injuries that required hospital admission happened at home. These findings concur with those made by other people.

The issue of burn injuries is more severe in underdeveloped nations because burn patients need more specialized facilities, which are more expensive and occasionally unavailable. The general public could be made aware of burn-related safety precautions through various communication mediums and instruction through schools and universities. It's important to have a good understanding of safer first-aid techniques, such using cold water right away after getting burns. Burns could be avoided by taking precautions and following safety protocols when handling electrical

wires and in industrial settings like factories and welding shops.

All public institutions should have access to modern burn care facilities as close to the accident site as possible.

Conclusion

After examining the epidemiological characteristics of burns, it becomes clear that particular recommendations are required to ease patients' suffering and prevent serious morbidity and mortality in the aftermath of injury.

It is important to increase national efforts to promote health and safeguard the underprivileged. To reduce the prevalence of burns, well-motivated social workers, medical and paramedical professionals, and government officials should work together. For the treatment of burn damage patients as well as its prevention and control, cost-effective, culturally appropriate, and sustainable therapies are required.

The interventions can include modern emergency burn care facilities, engineering of burn programs, their implementation in a focused manner, and education of society.

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