

Epidemiological Study of Burn Injury in a Tertiary Hospital, Jaipur, Rajasthan

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Abstract: *Background and objectives:* Burn injuries have been affecting humanity since long time and causing severe morbidities amongst the Indian population. Since prevention is more important than the treatment, this study was carried out to determine the important epidemiological determinants that will help us formulate effective preventive measures. *Materials and methods:* A cohort review that of patients who were admitted in burns tertiary centre at SMS Hospital, Jaipur over a period of 2 year period from 1st January 2020 to 31st December 2021. Data collected from admission books which included age, sex, total burns surface area, type of burn, outcome of patient and micro-organism isolated from burn wound on culture. Data analysed by using MS EXCEL software. *Results:* A total number of 2067 patients were included in the study. The most common age group affected was found to be 21-40, with male being mostly affected (69.03 %). The most common type of burn in our study was flame burn and the maximum total burn surface area in patients was found to be 41-60%. Overall mortality was 22.78% and the most common microorganism isolated in the positive cultures of patients was pseudomonas. *Conclusion:* High mortality rate was a major concern. Also the higher incidence of flame burn cases due to avoidable kitchen mishaps could be addresses by proper education amongst patients for safe kitchen habits.

Keywords: Burn, Epidemiology, Prevention

1. Introduction

Burn injuries have been affecting humanity since a long time. Burn trauma is as old as the discovery of fire in the history of mankind. There have been innumerable instances of suicidal and accidental flame burns, electric burns due to accidental contact to high tension wires and during work and scald burns due to hot fluids spillage and usually children bearing the brunt owing to poor living conditions and overcrowding.

As per WHO, burns account for estimated 300000 deaths annually, majority of which occur in developing countries.

Data collected from various hospitals in India-indicate a number of 7 million burn incidents in India each year, making it the second largest cause of injuries after road traffic accidents.

The cost of treatment for a single burn patient at a tertiary care setup was found to be around Rs 2000 pr percentage burn area of total burn surface area according to a 2018 research and in major burn up to Rs 6000 per percentage burn surface area.

Since treatment and post burn sequela is a major drain in a developing country, prevention is a key for avoiding such incidents.

Data lacunae causes ineffective implementation of policies. Hence this study is conducted to identify epidemiological characteristics in a tertiary care set up in north India which would help formulate better policies

2. Materials and Methods

This is a cohort review that included patients who were admitted in burns tertiary centre at SMS Hospital, Jaipur over a period of 2 year period from 1st January 2020 to 31st December 2021.

The following variables were measured in the patients admitted in our setup: age, sex, type of burn, total body surface area according to Lund and Browder chart, microorganism isolated from wound culture and outcome.

3. Results

The study included a total of 2067 patients admitted to the burn unit between the aforesaid time period. Regarding gender, 69.03% were male and 30.96% were female.

The most frequent range was 21 to 40 years (44.4%).

Table 1

Age wise distribution	
0-20yrs	776
21-40	919
41-60	303
61 – 80	63
>81	6
Total	2067

Sex distribution showed predominance in males patients 69.03% and females 30.96%.

Majority of burn cases (50.3%) were of flame type which included domestic burns in kitchen, kutcha houses, synthetic or loose clothing worn during cooking or cylinder mishaps. There were 30.57% of electric burn cases due to contact while handling electric devices, contact to high tension lines while working at construction sites and flash injuries in electricians.

Table 2

Type of burn	
Flame	1040
Electric	632
Scald	327
Miscellaneous (Chemical)	68
Total	2067

910 patients admitted during the 2 year study period were charted to have total body surface area burns of about 41-60% range.

Table 3: Percentage of total body surface area burnt

<21	310
21-40	475
41-60	910
>60	372
Total	2067

The overall mortality was 22.78%.

Table 4: Outcome of burn patients

No of patients discharged	1041
No of patients absconded	449
No of patients expired	471
No of patients transferred out	106

Table 5: Micro-organisms isolated from wound cultures sent.

Number of positive cultures 1777 and 290 cultures with no growth in culture.

Various organisms isolated in positive cultures:

Pseudomonas sp.	30%
Acinetobacter sp	20.9
Proteus	16.3
Enterobacter	11.6
Klebsiella	4.7
Citrobacter	2.3
Staphylococcus aureus	2.3

4. Discussion

The epidemiology of burn varies from one part of the world to another owing to the difference in civilisation and culture among other things. A visible lack of uniformity was also experienced between the methods and variables between studies making the comparison between the two studies even more difficult.

In this present study, the incidence of burn injuries was higher in males than compared to females.

The studied patient ranged from 35 days of age to 81 years of age, the majority of patients being mostly young, in the age group 21 years to 40 years group followed by the less than 20 year-old age group. It is clear from the study that women and children are at greater risk of burns and that most of these injuries occur at home. Many cases were due to activities involving cooking and serving hot drinks and heating water. Also the design of homes and inadequate safety provisions at home for play.

Seasonal variations were also noted where the winter season saw more scald and flame burns due to the heating of water and fireplaces used in villages for warming. On the other hand cases of electric contact, burns were found more during monsoons.

Flame burns were found to be in higher numbers in current study which was followed by electric burns which included contact as well as flash burn. This was followed by scald burns and chemical burns respectively.

In our study, 910 patients fell into 41-60% TBSA. The mortality was around 22% for the 2-year period data collected and about 50 percent patients were discharged after either operative procedures done to give wound cover or after proper resuscitation and treatment. The factors affecting mortality included extremes of age, female gender, a greater TBSA, depth of burn, delayed admission, and referral from primary health care centres.

All patients admitted had their wound pus cultures sent during their first dressings. Reports were dispatched in around 5 days. In this study 1777 (86%) samples came positive for organisms and 14% were sterile. The most commonly isolated organism was found to be Pseudomonas sp. (30.2%), then Acinetobacter 20.9% followed by Proteus 16.3%.

5. Conclusion

Burn injuries are an important public health issue in India. It is also a leading cause of morbidity and mortality. A patient of burn injury not only suffers individually but also the family suffers. Such studies and epidemiologies help to formulate effective preventive programs, especially for high-risk groups and also useful for formulating standard treatment protocols.

References

- [1] WHO The injury chart book, a graphical overview of the burden of injuries.
- [2] Park K, 18th edition, Jabalpur Banarasidas, Bhanot Publishers 2005.
- [3] Gupta JL, Makhija Lk, Bajaj sp, national programme for prevention of burn injuries, Indian journal of plastic surgery 2010.
- [4] Ahuja rb, goswami p, cost of providing inpatient burn care in a tertiary teaching hospital in north india, burns 2013
- [5] Ebenezer R, Rohit V, Isabella P, Ramakrishnan N, Krishnan G. Epidemiology of burns patients in a tertiary care hospital in South India: a retrospective analysis. Ann Burns and Trauma.2018; 2 (1): 1006.
- [6] Bhadra KA. Mahajan's Methods in Biostatistics for Medical Students and Research Workers.8th ed. New Delhi: Jaypee Brothers Medical Publishers; 2016: 117-9.
- [7] World meter. Fact sheet: Indian population (Live), 2020. Accessed on 2 March 2021.
- [8] Hettiaratchy S, Papini R. Initial management of a major burn: II—assessment and resuscitation. BMJ.2004; 329: 101-3.
- [9] University Rochester medical center. Fact sheet: Classification of burns