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Clinical study and management of burns in adults

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Abstract

Background: Burn injuries are amongst one of the most devastating of all injuries, having a great impact on the patients physically, physiologically and psychologically. Burns are still one of the top causes of death and disability in the world.

Aims: To study the etiology of burn, nature of burn and mortality rate in burn patients.

Material and Method: A prospective institutional two year observational study of 100 patients of burn injury admitted under department of general surgery at Solapur.

Result: Highest number of patients was from 18 to 30 years. The Female to male ratio is 1.77:1. Maximum number of patients has 81-100% burn (31%) with mixed burn in 51%. Accidental burn (79%) was the most common type of burn. Flame burn (74%) was most common. Overall mortality was 55%, recovery in 27% and 18% cases have residual disability.

Conclusion: Accidental flame burn commonly affects young females with maximum patients having 81-100% TBSA. Mortality was more than 50%.

Keywords: Burn, TBSA, flame, accidental, mortality

Introduction

Ever since man discovered fire, he has burnt himself either accidentally or intentionally. Burns are the oldest type of injuries that man suffers from and it is one of the important causes of mortality and morbidity. Burns afflicts all segments of the society. The rich or poor, men or women, children or adults may fall victim to it. The pattern of causation of burn injuries changes with the passage of time and varies from country to country.¹ The exact number of cases is difficult to determine, however in a country like India, with a population over 1 billion, we would estimate 7,00,000 to 8,00,000 burn admissions annually. Burn injuries rank among the most severe types of injuries suffered by a human body with an attendant high mortality and morbidity rate.² In different communities the etiological factor of burn injuries varies considerably, hence a careful analysis of the epidemiological factors in every community is needed before the planning and implementation of a sound prevention program and treatment protocol.

Material and Methods

It was a prospective study of 100 patients of burn injury admitted in a burn ward, under the department of surgery, at the teaching hospital of the Medical College during the period from December 2017 to October 2019. A total of 100 patients admitted in a burn ward during the said period was taken for study. Detailed history and examination of patients were done; the data was obtained by questionnaire-interview with the patients themselves or a relative. Detailed history was taken like age, sex, mode of burn injury. Treatment was given accordingly. As soon as the patient comes to the casualty the attending doctor estimates the percentage of burn (TBSA) involved. The total body surface area estimated by Wallace's rule of nine. Intravenous fluids were given to patients having more than 10% TBSA. By the Parkland's formula fluid requirement was estimated. Iv antibiotics and iv analgesics were given. Intravenous antibiotics change according to pus culture sensitivity. In selected patients, surgical procedures like escharotomy, release incision, skin grafting, amputation, etc. were done according to the need.

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Monitoring of the patient was done clinically and by routine laboratory hematological, biochemical & radiological investigations. Each patient was observed till final outcome. Discharged patient followed up in OPD. After completion of data collection the results were put in excel sheets for finding final results as per the objectives of the study.

Inclusion criteria

All the patients of age 18 years and above, irrespective of sex, presenting with burn injury will be included.

Exclusion criteria

1. Patients below the age of 18 years will be excluded.
2. Patient not willing for enrollment in the study.

Observations and Results

Table 1: Age wise distribution burn of injury

Sr. No	Age	Number	Percentage
1	18YRS - 30YRS	37	37%
2	31YRS - 40YRS	24	24%
3	41YRS - 50YRS	13	13%
4	51YRS - 60YRS	08	08%
5	61YRS - 70YRS	11	11%
6	> 70YRS	07	07%
	Total	100	100%

The Mean age was 40.6 years. The median age was 21 years and the modal age was 24 years. S.D. 17.5 years.

In our study the most common age group affected is between 18 yrs – 30 yrs. Patients more than 70 years old contributed to 7.00% of the total cases.

Table 2: Sex wise distribution

Sr. No	Sex	Number	Percentage
1	Female	64	64%
2	Male	36	36%
	Total	100	100%

Out of 100 patients, 64 were female and 36 were male. The female to male ratio is 1.77:1.

Table 3: Composition of Burn injuries according to TBSA (Total Body Surface Area) (%) of burn injury

Sr. No	TBSA (%) involved	Number	Percentage
1	<20%	13	13%
2	21-40%	19	19%
3	41-60%	17	17%
4	61-80%	20	20%
5	81-100%	31	31%
	Total	100	100%

Table 4: Distribution of burn injury according to depth of burn

Sr. No	Depth of burn	Number	Percentage
1	Superficial	19	19%
2	Deep	30	30%
3	Mixed	51	51%
	Total	100	100%

Table 5: Distribution of burn injuries according to nature of burn injury

Sr. No	Nature of burn	Number	Percentage
1	Accidental	79	79%
2	Suicidal	17	17%
3	Homicidal	04	04%
	Total	100	100%

In our study, most of the burns (79%) is accidental, followed by a suicidal burn (17%) followed by a homicidal burn (4%)

Table 6: Distribution of burn cases according to cause of burn injury

Sr. No	Type of burn	Number	Percentage
1	Flame	74	74%
2	Scald	18	18%
3	Electrical	05	05%
4	Chemical	03	03%
	TOTAL	100	100%

It is revealed that (74%) of burn cases occurred due to flame burns, scald burn accounted for (18%), electrical burn (05%) and Chemical burn account for (3%)

Table 7: Distribution of burn injuries according to season

Sr. No	Season	Number	Percentage
1	Summer	30	30%
2	Rainy	22	22%
3	Winter	48	48%
	Total	100	100%

Majority of burn injuries occurred during winter (48%) followed by summer (30%) followed by a rainy season (22%).

Table 8: Distribution of burn injuries according to marital status

Sr. No	Marital status	Number	Percentage
1	Married	78	78%
2	Unmarried	22	22%
	Total	100	100%

Our study revealed that the majority of burn cases are married

Table 9: Incidence of burn injuries according to education

Sr. No	Education	Number	Percentage
1	Literate	42	42%
2	Illiterate	58	58%
	Total	100	100%

Our study revealed that the majority of burn cases are illiterate

Table 10: Surgical intervention done

Sr. No	Surgical intervention	Number	Percentage
1	No intervention (Daily dressing)	31	31%
2	Escharotomy	29	29%
3	Escharectomy (Tangential excision)	26	26%
4	Escharectomy + Skin grafting	10	10%
5	Amputation	4	4%
	Total	100	100%

The majority of patients managed by surgical intervention (69%) among that escharotomy being (29%) most common.

Rest treated conservatively with daily dressings and wound care only (31%).

Table 11: Distribution of burn injuries according to their final outcome

Sr. No	Outcome	Number	Percentage
1	Recovery	27	27%
2	Residual disability	18	18%
3	Death	55	55%
	Total	100	100%

In the present study, 27% cases recovered with complete cure and residual disability in 18%. The overall mortality was 55%.

Discussion

Burn injuries and their related morbidity, disability and mortality represent a public health problem mainly in developing countries. The epidemiology of burn injuries varies from one part of the world to another being a function of the level of civilization, industrialization and culture among other things. In our study the maximum percentage of burn (37%) is between 18-30 yrs similar finding have been observed in studies reported

by Koulapur *et al.* [3] 34.4%, Chauhan *et al.* [4] 43.2%, Singh D *et al.* [5] 44.58%, Dasari *et al.* [6] 43.5%, Darshan *et al.* [7] 32.5%. High incidence of burns in this age group may be because this age group is generally a more active age group and more commonly exposed to hazards both at work and at home. This age group also included newly married females who became victims of bride burning. In the present study, 64% were females. The female to male ratio is 1.77:1.

These findings are similar to various studies Haralkar *et al.* [8] 2.1:1, Chawla *et al.* [9] 1.77:1, Dasari *et al.* [6] 2.16:1, Bhansali *et al.* [10] 1.68:1, Bilwani *et al.* [11] 1.58:1, Castana *et al.* [12] 1.58:, Haberal *et al.* [13] 1.96:1. Female predominance may be because in our country cooking is considered as the primary responsibility of females so they are more exposed to fire than males. Indian females wear loose fitting clothes like Sari which can catch fire easily.

In the present study, it was observed that majority of burn victims (31%) had involved 81-100% TBSA, a similar result was observed in studies conducted at Ahmedabad by Bhatt *et al.* [14], Chawla *et al.* [9], Chauhan *et al.* [4], Singh A *et al.* [15]. In contrast, in another study conducted by Shankar *et al.* [16] showed that majority of burn victims (17.7%) had 20-29% TBSA. In another study conducted in central Malawi by Samuel *et al.* [17], showed that majority of burn victims (43.1%) had <10% TBSA. So the admission of burns in each country and in different parts of the country has a profile consistent with population demographics. In our study, Mixed burns were observed in 51% of cases, these findings were consistent with various studies Khan TS *et al.* [18] 56.3%, Wani *et al.* [19] 60.9%. The majority of our patients had flame burn injury which causes mixed superficial and deep burn injury.

In our study, most of the burns (79%) were accidental, Similar results were observed in study by Haralkar *et al.* [8] (79.3%), Koulapur *et al.* [3] (78.2%), Pravin *et al.* [20] (83.6%), Bilwani *et al.* [11] (77.5%), Subrahmanyam *et al.* [21] (82.6%).

Accidental burns are common, maybe because of ignorance, poor standards of safety measures, cooking at floor level and wearing loose clothes like saree and dupatta. Suicidal burns may be due to adjustment problems after marriage, domestic violence, stress and depression related to worse interpersonal relationship within family members.

In our study, it was revealed that (74%) of burn cases occurred due to flame burns. Similar findings found in studies conducted by Pravin *et al.* [20] (77%), Saquib *et al.* [22] (70%), Attia *et al.* [23] (66.8%), Bataineh *et al.* [24] (65.4%).

The highest incidence of flame burns was explained by use of oil lamps, kerosene lamps in villages, candles for lightening, substandard kerosene and gas stoves, use of coal or wood chulla for warmth and cooking in villages.

In our study, maximum burns occur during winter (48%) and least in rainy season (22%) of total cases.

Similar findings found in studies conducted by Haralkar *et al.* [8], Shankar *et al.* [16], Singh A *et al.* [25], Khan AA *et al.* [26], El Sonbaty *et al.* [27].

Increased number of cases during winter season in our study can be explained on the grounds that people come in contact with warm items like camp fire. During winter season festival like Diwali, where there are lots of fireworks also comes during the winter months.

In our study, 78% burn cases were married. Similar findings were seen in a study conducted by Singh A *et al.* [25] 76.8%, Ghaffar [28] 72.5%, Panda *et al.* [29] 78%, Bhatt *et al.* [14] 75.4%, Dasari *et al.* [6] 82.6%. Females physical and psychological stress of marriage, harassment by parents-in-law or dowry harassment was observed. Also in day to day life problems like cooking, children, etc. and hurrying through the overcrowded room with minimal amenities invite frequent accidents. In

married males, unemployment and depression were the common cause.

In our study, among 100 patients, 58 patients were illiterate and 42 were literate. Present findings were similar to studies conducted by Haralkar *et al.* [8] 60%, Akther *et al.* [30] 62.3%. Burns are more common in illiterate people because illiteracy is usually associated with ignorance, low socio-economic status and lack of knowledge about preventive measures.

In our study, surgical intervention done in 69% of cases and the rest treated conservatively with daily dressings and wound care only (31%). Of surgical intervention done, most common is escharotomy done in 29% of cases.

In the following study most common surgical intervention done is skin grafting Gupta *et al.* [31] 46%, Saquib *et al.* [22] 40%, Bilwani *et al.* [11] 35%.

In the present study, 27% cases recovered and 18% had residual disability. The overall mortality was 55%, as mortality is the most common outcome. These findings similar to various studies conducted by Shankar *et al.* [16] 41.6%, Bhansali *et al.* [10] 54.5%, Singh *et al.* [15] 72.4%, Haralkar *et al.* [8] 65.7%. A study conducted by Nadkarni *et al.* [32] shows 54.1% burn cases recovered.



Fig 1: Flame Burn



Fig 2: Electric Burn



Fig 3: Post Burn Contracture

Conclusion

Young patient age group of 18-30 years, most commonly affected with burn, with female preponderance. Accidental burn was most common with a maximum burn in winter season. Common in married and illiterate people.

Flame burn was most common, with maximum patient having a mixed type of burn; 81-100% burn patients were maximum.

Mortality was observed in 55%, with complete recovery in 27% cases.

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