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Burns Open

journal homepage: www.burnsopen.com

Epidemiology and outcome of hospitalized burns patients in tertiary care center in Nepal: Two year retrospective study

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ARTICLE INFO

Article history:

Received 11 March 2017
Received in revised form 27 March 2017
Accepted 27 March 2017
Available online xxx

Keywords:

Burns
Injury
Epidemiology
TBSA
Nepal
Retrospective study

ABSTRACT

Background: Burns are a leading cause of morbidity and mortality in Nepal. The epidemiological characteristics of burn vary widely throughout the world. Accurate understanding of the epidemiological characteristics of burns is key for strategic planning of effective prevention programs.

Methods: This study was retrospective case series study, conducted on 284 patients admitted in our center over the period of 2 year from January 2014 to December 2015. Data collection included patient's age and sex, extent of burn, etiology, timing of burn injury, place of burn, length of hospital stay and mortality.

Result: A total of 284 patients were registered over the study period. More female sustained burn injury than male. Most burn victims falls in the working age group (16–59 years), which is 65.5% ($n = 186$). Burns were more common during winter (December–February) followed by autumn (September–November). Flame burns were the commonest cause of burn injury, followed by scald burn. 54.6% patients sustained less severe burns (<15% TBSA) in our study. Mean hospital stay was highest among the electric burn patient. Overall mortality in our study was 25.4% ($n = 72$), whereas mortality for patients with more than 40% TBSA burn was 95%. Sepsis and pneumonia was the most common cause of mortality in this study.

Conclusion: Flame is the most common cause of burn injury in Nepal with more severe form of injury associated with high mortality among the victims. Female were the most vulnerable for burn with high mortality. Prevention program should focus on rural areas with high incidence rate.

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1. Introduction

Burns are a public health problem throughout the world. It is estimated that every year 265,000 deaths occurs due to burn throughout the world, but majority of these deaths occurs in low and middle income (LMIC) countries and almost half occur alone in South-East Asia region [1]. Burns are second most common injury in rural Nepal, accounting for 5% of disabilities [2]. Although, Nepal shares a big burden of burn injury, epidemiological study related to burn from Nepal are scarce. The epidemiological study is prerequisite for planning and implementing prevention program in the community. Although prevention program are most difficult to conduct comparing to treating acute burn or post burn contracture, but it is most rewarding.

In this study we tried to identify and analyze the epidemiological characteristics along with clinical aspects of burn patient admitted in our burn center during two years period. The purpose of this study was to further understand the epidemiological characteristics of burn injury in Nepal and recommend measures to bring down the incidence of burn and improve the health care to the burn patients reducing the morbidity and mortality.

2. Materials and methods

The research proposal was presented to the hospital ethical committee and was approved. This was a retrospective case series studies conducted over the period of 2 years from January 2014 to December 2015 at Kirtipur Hospital, Nepal. The data was collected from the patients record section of the hospital. Patients characteristics (e.g. age, sex), cause and severity of injury, outcome, hospital stay and seasonal variation were examined in this study. The data were entered in a Microsoft Excel spreadsheet and analyzed.

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<http://dx.doi.org/10.1016/j.burnso.2017.03.001>

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Table 1
Distribution based on age and gender.

Age group	Male	Female	Total	%
0–15 years	34	25	59	20.8
16–59 years	81	105	186	65.5
>60 years	11	28	39	13.7
Total	126	158	284	100

3. Results

A total of 284 patients were admitted during our study period of 2 years from January 2014 to December 2015. The results of study are categorized for the simplicity.

3.1. Age and gender

The mean age of burn patients was 33 years with a range of 3 months to 88 years. Our study consisted of 158 female patients (55.6%) and 126 male patients (44.4%) with female to male ratio of 1.2. The most frequently hospitalized burn patients were in age group 16–59 years, which accounted for 65.5% of patients. Only in pediatric age group (0–15 years) more male sustained burn injury than female (Table 1).

3.2. Seasonal variation

Burns were more common during winter season (December–February) followed by autumn season (September–November), with 97 cases (34.1%) and 69 cases (24.3%) respectively. The highest number of admissions was during the month of December. Table 2 presents a monthly admission along with the type of injury.

Table 2
Seasonal variation of burn injury.

Season	Months	Flame burn	Scald burn	Electric burn	Acid burn	Contact burn	Total
Spring	March	13	2	4	2	1	22
	April	13	5	1	1	0	20
	May	5	6	1	0	0	12
	Total	31	13	6	3	1	54 (19%)
Summer	June	9	3	3	1	0	16
	July	14	4	4	0	1	23
	August	13	7	5	0	0	25
	Total	36	14	12	1	1	64 (22.5%)
Autumn	September	6	4	8	0	0	18
	October	16	4	3	0	0	23
	November	21	5	2	0	0	28
	Total	43	13	13	0	0	69 (24.3%)
Winter	December	29	5	2	0	0	36
	January	28	6	1	0	0	35
	February	18	5	3	0	0	26
	Total	75	16	6	0	0	97 (34.2%)

Table 3
Causes of burn injury.

Cause of burn	Total (%)	Gender		Age Group		Average % TBSA involved
		Male	Female	0–15 years	≥16 years	
Flame burn	185 (65.2%)	66	119	17	168	19.9
Scald burn	56 (19.8%)	30	26	37	21	10.5
Electric burn	37 (13%)	30	7	5	32	9.5
Acid burn	3 (1%)	3	0	1	2	1
Contact burn	3 (1%)	1	2	0	3	1

3.3. Causes of burns

Flame burns were most common cause of burn injury in our study which accounted for 185 cases (65.2%). Similarly, scald burn and electric burn were other common causes of burn injury which accounted for 56 cases (19.8%) and 37 cases (13%) respectively. There were 3 cases of contact burn and 3 cases of acid burn during our study. Flame burn were significantly higher among the female whereas electric burn among the male. Table 3 lists causes of burn along with gender, age group and TBSA involved Table 4.

3.4. Severity of burn injury

The percentage total burn surface area (% TBSA) of burn patient range from 1% to 95%. In our study 155 (54.6%) patients sustained <15% TBSA burns, 89 (31.3%) patients sustained 15–40% TBSA burns and 40 (14.1%) patients sustained >40% TBSA. Average % TBSA involved for flame burn, scald burn, electric burn, acid burn and contact burn were 19.9%, 10.5%, 9.5%, 1% and 1% respectively.

3.5. Place of burns

Most burn incident took place inside the house (206 cases), where 123 cases of them occurred in the kitchen. 48 cases were work related and 30 cases were in open space in our study.

3.6. Lengths of hospital stay among the surviving patient

Hospital stay among the surviving patient ranged from 1–126 days. The mean hospital stay for flame burn patients (121 patients) was 21 days, scald burn patients (55 patients) was 13 days, electric burn patients (34 patients) was 26 days, contact burn patients (3 patients) was 9 days and acid burn patients (3 patients) was 12 days.

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