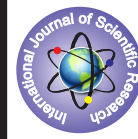


## “Electrical and Thermal Burns in Jhalawar Region”



## Biochemistry

**KEYWORDS:** Injury, Thermal, TBSA

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### ABSTRACT

Developing countries have a high incidence of burn injuries making them an endemic health hazard. High population density, illiteracy and poverty are the main demographic factors associated with high risk of burn injuries. Total of 105 patients were enrolled in our one-year study. Young adults with preponderance of female sex constituted main age group in our study series. Thermal injuries were seen in 68% of patients and kitchen was the predominant place of accident. 32% of patients had burns involving more than 60% of total body surface area. 56.7% of mortality was seen in our study cases.

### Introduction

Burn injuries pose a challenging spectrum of problems, as they constitute a major cause of accidental deaths as well as prolonged morbidity in those who survive. Burn injuries, whether minor or major are a prime cause of suffering and misery, besides causing a heavy economic loss due to work absentees and on top of that the high cost of subsequent treatment required. Survivors are more prone to develop long term psychological and physical sequel with devastating consequences to them, their family and society in general [1]. The exact number of burns is difficult to determine, but various studies suggest that India with a population of over one billion has 700,000-800,000 burns admissions annually [2]. Burn accidents are very common in our society. Domestic accidents, lack of appropriate safety measures, negligence in certain working environment and unsafe use of materials associated with festivals (fireworks) make burns a very common admission in our emergency wards. The aim of this study was to record these factors in patients admitted to our burn unit and to make relevant recommendations.

### Material and Methods

A total of 105 patients with burn admitted in Burn Ward of Department of Surgery, S.R.G. Hospital, Jhalawar were participated in this study. Detailed history was taken and data on age, sex, occupation, area of residence and type of accommodation and number of occupants was recorded. Thorough examination was done and following characteristics of burn wound were recorded: cause, mechanism, total body surface area involved, first aid given in hospital stay. These patients were followed up during their stay in hospital and their outcome was recorded. All patients were managed as per the hospital protocol.

### Results

#### Age & Sex

Total of 105 patients were enrolled in the study. Thirty percent of patients were in the age group of below 20. Young adults constituted 52.4% of patients. Burn injury to the patients over the age of 40 years was relatively infrequent (15.2%). The youngest patient in our series was ten year old and the eldest was 80 years old (Table 1). There were 58% male patients in contrast to 44% of female patient. Majority of patients (77.3%) belonged to middle and lower socioeconomic class in our study series.

#### Place of burns

Kitchen was the predominant place of accident in 88.6% of cases, followed by living room in 14%. Only 2.6% of patients acquired burns at their work place while 8.6% received burns during outdoor activities.

#### Precipitating factor

No predisposing factor was present in 86% of the cases. Alcoholism was the commonest predisposing factor present in 6% of patients, while marital disharmony among couples accounted for 4.6% of cases, remaining 3.4% had history of psychiatric illness and were

under treatment.

### Cause of burns

Thermal injuries were seen in 105 of patients, out of this 48% were flame burns: 33% were scalds injuries were inflicted due to hot solids and liquids. 19% patients were admitted with electrical burns. Total body surface area involved Of 105 patients admitted, 35% had burn injuries involving 30% or more of body surface area. 32% of patients had burns involving more than 60% of body surface area. The number of extensive burns in our study were thermal burns. Burn index, which takes into account both the partial and full thickness burns, was also calculated. In our study series, 58 patients had burn index of 41 or more and among them 47 patients had a burn index of 60 and above (Table 2).

The anatomical site mainly burnt was trunk (49%) followed by lower limbs (40%) and head and neck (21%). First aid at the site of accident Out of 105 patients burns were cooled with water in 63 patients (42%), in 23 patients (17%) quilts or blankets were used to put out flames. Various creams were applied to burns in 12 patients (8%). Any sort of first aid was not given to 52 (33%) patients.

### Treatment

Medical treatment was given to all patients enrolled in the study. The study group received the same general treatment, adapted to the evolution of each case. Flame burns had a high mortality of 68% of total deaths, followed by electrical burn group 55% and 26% scald burn group (Table 3). There was only one mortality of burns involving less than 30% body surface area, which occurred in a patient of electrical injury with spinal shock.

### Discussion

Thermal and electrical burn injuries constitute a major cause of accidental deaths and prolonged morbidity in those, who survive leaving the patient not only physically disfigured but psychologically scarred. This study mainly emphasized on the collection of epidemiological data to target those vulnerable aspects of our life styles and patterns to prevent the trauma of burns.

Of the 105 patients admitted, maximum number of patients (52.4%) were in the age group of 21-40 years. This study correlates with our society patterns, where the adults in this age group are entrusted with the responsibilities both at home as well as outside as they are considered to be active (Table 4). There was a gradual decline in the number of patients more than 40 years, which is just another manifestation of our society pattern where older people are endowed with more of supervisory role of looking after young children rather than active work, as reported in other series [3,4]. Female dominance was noted in our study series, which seems more relevant in our context as household and kitchen responsibilities are mostly carried by females in our society and they share greater brunt of these domestic accidents. Besides this the dress pattern i.e use of clothes with flowing ends like saree or dupatta, which are a part of Indian

dress pattern also contribute to burn injuries in women. Other studies done by Sharma et al also noted female dominance in their study [5]. Majority of our patient in our study belonged to lower and middle socioeconomic status. This is due to unsafe kitchen habits as floor cooking and overcrowding commonly seen in lower socioeconomic strata. Sen et al also concluded similar findings in their study [5]. In our study, 86% of patients gave history suggestive of domestic accident as the cause of burns. Among various predisposing factors, which were present in 14% of cases, alcoholism was the commonest one followed by marital disharmony. The incidence of suicidal burns cannot be reliably calculated in our society as female patients invariably hide facts and will try to save their husbands and relatives, even when they are guilty. Sharma et al also support this view in their study [6]. Thermal burns were common in our study, probably due to use of open fires and pressure stoves for cooking. Accidental electrical injuries were also common due to stepping on loose live wires lying on ground or working on electric lines or poles. In children commonest type of burn injuries seen were scalds, reflecting poor supervisory control of parents, besides floor level cooking. Various other Indian authors have reported high incidence of thermal injuries followed by electrical injuries in their study series [6,7]. Large number of patients in our study series (35%) had burn injuries involving 40% or more of body surface area. The large number of extensive burns was due to use of blankets or quilts as first aid for extinguishing flame burns. This practice also led to deeper burns thereby increasing morbidity and mortality in our study.

**Recommendations**

A community based programme involving the active participation of health personnel is needed to educate various preventive measures against burn injuries. People have to be educated for adoption of safe cooking habits, which mainly include avoiding cooking at floor level, use of safe oil stoves and keeping hot liquids and cooked articles out of reach of children. Modification of dressing habits that is avoiding wearing clothing with loose ends or avoiding wearing synthetic clothing needs to be emphasized. There should be well-planned electricity codes in all residential areas or colonies. Electric poles should be well away from rooftops and all transformers should be well guarded and inaccessible to public. Legislative measures have to be promulgated for strict introduction of safe kitchen environment at the time of approval of house plans and ban on sale of inflammable garments. This study clearly indicates inadequacy of preventive measures in our community thereby stressing the need of a community based educative programme to decrease the incidence of burns as well morbidity and mortality from such injuries.

**Table 1. Demographic study of burn patients**

CATEGORY	NUMBER (%)
Age in years	
Below 20	32(30.4)
21-40	55(52.4)
41-60	16(15.2)
Above 60	2(2)
Gender	
Male	61(58)
Female	44(42)
Etiology	
Flame	50(48)
Scald	35(33)
Electrical	20(19)

**Table 2. Total Body Surface Area (TBSA%) involved in Different Age Groups**

Age (years)	(TBSA%) 21-30%	(TBSA%) 31-40%	(TBSA%) 41-50%	(TBSA%) Above 51%	Total
Below20	9	13	6	7	35(33%)
21-40	20	6	4	23	53(50%)
41-60	4	2	1	3	10(10%)
Above 60	4	--	2	1	7(7%)
Total	37(35%)	21(20%)	13(12%)	34(32%)	105

**Table 3. Mortality in Different Types of Burns (N=54)**

Age (years)	Flame (n=50)	Scald (n=35)	Electrical (n=20)	Total (N)
Below20	9	4	4	17
21-40	21	2	6	29
41-60	2	2	1	5
Above 60	2	1	--	3
%Among Total	34(63%)	9(17%)	11(20%)	54
%Among Group Group	68%	26%	55%	

**Table 4. Age wise distribution of different type of burn Groups (n=105)**

S.No	Age group (years)	Different type of burns						Total	
		Flame		Scalds		Electrical		No's.	(%)
		No's.	(%)	No's.	(%)	No's.	(%)		
1.	Below20	11	(22)	15	(43)	06	(30)	32	(30.4)
2.	21-40	35	(70)	11	(31)	09	(45)	55	(52.4)
3.	41-60	02	(4)	09	(26)	05	(25)	16	(15.2)
4.	Above 60	02	(4)	-	-	-	-	2	(2)
	Total	50	(48)	35	(33)	20	(19)	105	(100)

**References**

1. Barret JP, Gomez IS, M. Gonzalez-dorrego et al. Epidemiology and mortality of adult burns in Catalonia. Burns 1999; 25:325-29.
2. Ahuja BR, Bhattacharya S. Burns in developing world and burn disasters. BMJ 2004; 329:447-49.
3. Ghuliani KK, Tyagi NK. An epidemiological study of burn injury. Ind J Public Health 1998; 32(1): 24-30.
4. Gupta M, Gupta OK. Burn epidemiology: The Pink city scene. Burns 1993; 19(1):47-51.
5. Sen PK, Kini SV, Lotlikar KD. Analysis of the causes of accidental burns in the city of Bombay during last 20 years. J Ind Med Assoc 1963; 40(2):51-56.
6. Sharma BK, Seth KK, Dharker RS. Burn injuries and their prevention. J Ind Med Assoc 1978; 71(8): 202-05.
7. Malla CN, Misgar MS. Analytical study of burns in Kashmir.