



A Clinico Epidemiological Study and Outcome of Burn Injury Patients Visiting Tertiary Care Centre at Gorakhpur District

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Abstract

Objectives: To study the clinic epidemiological correlates of burn injury patients.

Study design: A cross-sectional study

Study Settings: Burn & Plastic Surgery ward, Deptt of Surgery, B R D Medical College, Gorakhpur

Study Period: October 2016 to February 2017

Result: Out of 210 admitted burn patients, 41.4% were male and 58.6% were female subjects showing female predominance. Most of the burn patients belonged to 21–40 years of age group, rural areas, Hindu, unemployed and married. Majority were living in nuclear families (62.4%) belonging to lower socio-economic class. Maximum burns occurred in between 11 am- 5 pm (34.8 %). Thermal or flame burn was common and accidental in nature (88.6%) with female predominance. Cases of domestic burns (86.2%) were more as compared to the outdoor burn (13.8%). The proportion of deep burns was found significantly higher in females (97.4%). Majority of patients (59%) were wearing synthetic clothes at the time of burn. Overall mortality was 46.2%, although mortality was more in female subjects.

Keywords: Burn injuries, sociodemographic factors, hospital, outcome.

Introduction

Burn injury is one of the most severe trauma a person can experience and a life threatening state in which all of the main integrating systems in the body are affected¹. Burn injury is the globally occurring health problem leading to high disability, disfigurement & dependency. Burns are the fourth most common type of trauma worldwide². The majority of burn cases occur in low and middle-income countries and almost half occur in the WHO South-East Asia Region.

Burns are also a leading cause of disability and disfigurement. Estimated annual burn incidence in India is approximately 6 to 7 million³. Apart from having painful physical trauma and complications like shock, sepsis contracture/ scar coping up during its acute phase, it is also associated with long term psychosocial consequences due to disfigurement and disability.

Keeping this in background, this study was undertaken with objectives to study the sociodemographic factors of burn patients in

tertiary care centre, to find out the cause and outcome of burn patients admitted in Medical College, Gorakhpur, and to draw conclusion about preventive aspects of burn injuries.

Materials and Methods

An interview based cross-sectional study was conducted on all the patients who were admitted in Burn and Plastic Surgery ward of B.R.D. Medical College, Gorakhpur from October 2016 to February 2017. A total of 278 patients were admitted. Out of these, 68 either refused to give consent or took LAMA or expired within few hours of admission. Therefore a total of 210 patients were enrolled for socio-demographic

profile and etiology of burn. An interviewer based detailed socio-demographic profile and etiology of burn questions were asked from the conscious patients who gave consent to participate in the study. In case of unconscious patients or patients less than 18 years of age or those who were unable to give the interview, these questions were asked from the attendants of the patient after taking their consent. Data regarding sociodemographic profile and etiology of burn patients were recorded on predesigned and pretested questionnaire. The data collected through questionnaire was entered in the MS Excel spread sheet and analysed using SPSS and chi-square test were applied to show significance between the variables.

Results

Table-1: Description of studied subjects according to their Sociodemographic profile (N= 210)

Characteristics		N (%) (210)	Male (87; 41.4%)	Female (123; 58.6%)	Test of significance
Age in years	<20	64 (30.5)	29 (45.3)	35 (54.7)	$\chi^2= 0.36$ $p>0.05$
	21-40	114 (54.3)	39 (34.2)	75 (65.8)	$\chi^2=4.72$ $p<0.05$
	41-60	25 (11.9)	15 (60)	10 (40)	$\chi^2= 4.72$ $p>0.05$
	>60	7 (3.3)	4(57.1)	3 (42.9)	$\chi^2= 0.219$ $p>0.05$
Area of residence	Rural	127 (60.5)	54	73	$\chi^2= 0.157$
	Urban	83 (39.5)	33	50	$p>0.05$
Marital status	Married	125 (54.5)	47 (35.2)	78 (64.8)	$\chi^2= 4.32$ $p<0.05$
	Unmarried	76 (36.2)	34 (44.7)	42 (55.3)	$\chi^2= 2.14$ $p>0.05$
	Widow/ widower	9 (9.3)	6 (66.7)	3 (33.3)	$\chi^2= 1.5$ $p>0.05$
Religion	Hindu	196 (93.3)	83	113	$\chi^2= 1.021$
	Muslim	14 (6.7)	4	10	$p>0.05$
Educational qualification	Illiterate	66 (31.4)	21	45	
	Primary school	36 (17.1)	16	20	
	Middle school	33 (15.7)	13	20	
	High school	28 (13.3)	13	15	
	Intermediate	35 (16.7)	14	21	
	Graduate or above	12 (5.8)	10	2	
Occupation	Employed	66 (31.4)	57 (86.4)	9 (7.3)	$\chi^2=80.091$
	Unemployed	144 (68.6)	30 (13.6)	114 (92.7)	$p<0.05$
Type of family	Nuclear	131 (62.4)	47	84	$\chi^2= 4.421$
	Joint	79 (37.6)	40	39	$p< 0.05$
Socioeconomic status	Class I	3 (1.4)	2	1	
	Class II	9 (4.3)	2	7	
	Class III	34 (16.2)			
	Class IV	79 (37.6)	37	42	
	Class V	85 (40.5)	26	59	

Table 1 shows, out of 210 burn patients 58.6% were female while 41.4% were male subjects. The male: female ratio was 1: 1.41 in our study showing female predominance. Most of the burn patients belonged to the age group of 21–40 years with female predominance i.e. 65.8%. Overall predominance of burn cases were seen among rural inhabitants (60.5%), married females (54.5%), Hindus (93.3%), illiterate groups (31.4%) and in among those belonging to lower

socioeconomic class (40.5%). There was no significant association found among these groups. A majority of the burn patients were unemployed (144; 68.6) while 66 (31.4%) were employed. The proportion of unemployed female burn patients was found significantly higher as compared to unemployed male burn patients. In relation to type of family it was found that the majority of burn patients 131 (62.4%) were living in nuclear families while 79 (37.6%) were living in joint families. There was a significant association seen.

Table-2: Description of studied subjects according to the epidemiology of burn (N= 210)

Characteristics		N (%) (210)	Male (87; 41.4%)	Female (123; 58.6%)	Test of significance
Time of incidence of burn	5am-11am	63 (30)	15 (23.8)	48 (76.2)	$\chi^2= 7.5$ $p<0.05$
	11am-5pm	73 (34.8)	39 (53.4)	34 (46.6)	$\chi^2= 5.9$ $p<0.05$
	5pm-11pm	66 (31.4)	29 (43.9)	37 (56.1)	$\chi^2= 0.12$ $p>0.05$
	11pm-5am	8 (3.8)	4 (50)	4 (50)	$\chi^2= 0.02$ $p>0.05$
Nature of burn	Accidental	186 (88.6)	77 (41.4)	109 (58.6)	$\chi^2= 0.01$ $p>0.05$
	Homicidal	18 (8.6)	8 (44.4)	10 (55.6)	$\chi^2= 1.04$ $p>0.05$
	Suicidal	6 (2.8)	2 (33.3)	4 (66.7)	$\chi^2= 0.17$ $p>0.05$
Place of burn	Domestic	181 (86.2)	61 (33.7)	120 (66.3)	$\chi^2= 32.25$
	Outdoor	86 (41)	55 (63.3)	31 (26.1)	$p< 0.05$
Type of burn	Thermal	162 (77.1)	52 (32.1)	110 (67.9)	$\chi^2= 23.77$ $p<0.001$
	Scald	16 (7.6)	8 (50)	8 (50)	$\chi^2= 0.21$ $p>0.05$
	Chemical	3 (1.4)	2 (66.7)	1 (33.3)	$\chi^2= 0.09$ $p>0.05$
	Electrical	29 (13.8)	25 (86.2)	4 (13.8)	$\chi^2= 25.7$ $p<0.001$
Material worn	Synthetic	124 (59)	32 (36.7)	92 (73.9)	$\chi^2= 241.59$
	Cotton	86 (41)	55 (63.3)	31 (26.1)	$p < 0.001$
Degree of burn	Superficial	78 (37.1)	46 (52.8)	32 (26)	$\chi^2= 15.743$
	Deep	132 (62.9)	41 (47.2)	91 (74)	$p < 0.001$
Total body surface area	1-25%	38 (18.1)	30 (78.9)	8 (21.1)	$\chi^2= 0.06$ $p>0.05$
	26-50%	83 (39.5)	33 (39.7)	50 (60.3)	$\chi^2= 0.06$ $p>0.05$
	51-75%	42 (20)	17 (40.5)	25 (59.5)	$\chi^2= 0.002$ $p>0.05$
	76-100%	47 (22.4)	7 (14.9)	40 (85.1)	$\chi^2= 16.19$ $p<0.001$

Table 2 depicts that maximum number of burn cases occurred in between 11 am- 5 pm (34.8%) which was statistically significant ($p < 0.05$). It

was found that the time of occurrence of burn for majority of female patients was in between 5 am- 11 am (76.2%) while for male patients maximum

number of burns occurred in between 11 am- 5 pm (39%). In majority of cases the nature of burn was accidental (88.6%) with female predominance, followed by homicidal (8.6%) and suicidal (2.8%). Domestic burn (86.2%) occurred significantly higher as compared to outdoor burn (13.8%) ($p < 0.05$). Domestic burn showed female predominance. About 62.9% showed deep burn which was statistically significant ($p < 0.001$). Most of the burn cases occurred in those who

were wearing synthetic dress material and there was significant association reported with the material worn during the burn. Thermal or flame burn was common (77.1%) which was statistically significant ($p < 0.001$), followed by electric (13.8%) and scald (1.2%). About 39.5% showed 26- 50% burn while 22.4% showed more than 75% total body surface area (TBSA) involvement which was statistically significant ($p < 0.001$).

Table-3: Description of studied subjects according to the OUTCOME of burn (N= 210)

Outcome	N (210)	Male (87)	Female (123)
Recovery	2 (0.9)	2 (2.3)	0
Residual functional disability	18 (8.6)	13 (14.9)	5 (4.1)
Cosmetic disfigurement along with residual functional disability	32 (15.2)	24 (27.6)	8 (6.5)
Cosmetic disfigurement	93 (44.3)	44 (50.6)	49 (39.8)
Death	97 (46.2)	28 (32.2)	56.1)

Table 3 depicts that among the burn patients admitted maximum number of burn patients 97 (46.2%), expired, 93 (44.3%) had cosmetic disfigurement 32 (15.2%) had cosmetic disfigurement along with residual functional disability, 18 (8.6%) had residual functional disability while only 2 (0.9%) recovered completely.

Among the male burn patients admitted maximum number of patients 44 (50.6%) had cosmetic disfigurement, 28 (32.2%) died, 24 (27.6%) had cosmetic disfigurement along with residual functional disability, 13 (14.9%) had residual functional disability, and 2 (2.3%) recovered completely.

Among the female burn patients admitted maximum number of patients 69 (56.1%) expired, 49 (39.8%) had cosmetic disfigurement, 8 (6.5%) had cosmetic disfigurement along with residual functional disability and 5 (4.1%) had residual functional disability.

Discussion

Burn injuries are among the most devastating of all injuries and a major global public health crisis⁴. Almost 95% of global burn deaths and

disabilities are estimated to occur in low- and middle-income countries of the world⁵.

In our study, male:female ratio was 1:1.41 showing female predominance especially between 21 and 40 years of age similar with Verma et. al^{6,7}. Our data showed that the age group between 21 and 40 years is the most vulnerable to burn injuries for both genders, which is consistent with findings from other studies^{6,7}. Thus, overall female subjects were more likely to be at risk of burn injuries especially between 21 and 40 years of age owing to their domestic chores and invariably using unsafe equipments at home, and this is similar to other studies^{6,7}.

In our study, majority of the patients were Hindus and belonged to rural background which was supported by other studies also owing to their population proportion. Regarding marital status, most of the burn patients were married, especially married females were more victims, supported by another study^{6,8}. In our study majority of burn patients were illiterate (31.4%). Majority of patients (68.6%) were unemployed and among the nonworking class, housewives also similar to Gandhari et. al^{7,8}.

In our study, majority of burn patients belonged to nuclear families. Most of the cases (40.5%) were from class V (Lower) socioeconomic group followed by 37.6% from class IV (Upper Lower) socioeconomic group^{6,7}.

Maximum number of burns (37.78%) occurred between 11 am to 5 pm which is significant ($p < 0.05$) while minimum number of burns (3.8%) occurred between 11 pm to 5 am when most of the people are sleeping. It is clear that one is busy during morning and afternoon hours in cooking and a mistake with fire in hurry can result in burns. Only 3.8% of burns occurred at night between 11 pm to 5 am when most of the people are sleeping supported by another study^{8,9}.

Most of the burn injuries were accidental in nature, consistently found with others studies and flame burns or thermal burns were the most common causative factor for sustaining burns and are similarly found in other reports^{6,8}. Majority of burns (86.2%) took place at home and 13.8% at work place^{7,8}.

In our study conducted it was found that at the time fire caught them 73.9% had synthetic clothing and 26.1% had cotton clothing. It may be because Indian women wear loose flowing synthetic garments which can catch fire easily and cause extensive burn injury. It was found similar to study done by Shankar et. al⁹.

In our study, 62.4% had deep burn while 37.6% had superficial burn supported by other studies⁶. In the present study done it was found that TBSA was highest in 26-50% burn (39.5%) followed by 76-100% in 22.3% patients, 51-75% in 20% patients and lastly 1-25% burn in 18.1% patients. The mean TBSA of male burn patients was 39.8% while that of female burn patients was 60.2%. It was supported by other studies^{6,7}.

Mortality rates were found about 46.2% similar in other studies. Our study reported that burn mortality was more in female than male subjects⁸.

Conclusion and Recommendation

In our study incident of burn was more among females than males. A majority of burn patients lie

in the age group of 21-40 years (114; 54.3%). Most of the cases among these age group were domestic. Lack of proper knowledge is the keyhole of most of these accidents. There was a higher percentage of burn cases reported among rural, illiterate, married Hindu females those who were belonging to nuclear families and lower socioeconomic class. The public especially housewives and young girls should be properly educated about use of LPG gas cylinder and stoves. Awareness should be generated regarding wearing of well fitted cotton clothes while handling kitchen works.

Post burn patient should be counselled so that they (i) can maintain a normal routine. (ii) Take time to do things that feel good to them. (iii) Do not try to block out thoughts of what has happened. (iv) Practice relaxation exercises. (v) Try to return to normal work as early as possible.

Support from family and friends are strongly recommended. Counselling of spouse/family members is strongly recommended. The general public should be emphasized on prevention from burn rather than reacting violently to it.

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