



ORIGINAL RESEARCH PAPER

Epidemiology Medical Science

A SOCIAL AND EPIDEMIOLOGICAL STUDY AMONG BURNS PATIENT ATTENDING MULTI-SPECIALITY HOSPITALS IN GWALIOR (M.P.)

KEY WORDS: burns, epidemiology, socio- demographic factors, accidents.

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ABSTRACT

BACKGROUND: Developing countries have a high incidence of burn injuries, creating a formidable public health problem. The exact number of cases is difficult to determine.

Objective: To investigate the epidemiology of various causations and their outcomes in terms of morbidity and mortality. Also, the effect of social stigma associated with burns victim.

MATERIALS AND METHODS: All burn cases (n=432) admitted to the burn's unit of, Gwalior over a period of five years were investigated. The data regarding sex, age predisposition, geographical origin, mode and nature of injury were obtained by questionnaire-interview with the patient themselves. Clinical assessment was done in the form of depth and extent of injury and complications. The data was analyzed by Epi-info version 7.

RESULTS: Burns were found more commonly in middle-aged groups. The incidence was more in females as an absolute number (70.3%) as well as when stratified by age. Most burns were domestic, with cooking being the most prevalent activity. Flame (80.3%) was the most common agent. When using logistic regression analysis, the outcome of the burn injury was significantly associated with degree, depth, extent and mode of injury.

CONCLUSION: Majority of deep burns are accidental, seen in middle-aged housewives as a result of flame burns, and lead to death. So, measures should be taken to provide proper education to prevent these accidents and ensure safety.

Introduction- Burns are a global public health problem, accounting for an estimated 265,000 deaths annually. Most of these happen in low- and middle-income countries and nearly half happen in the WHO South-East Asia Region. In India, more than 1,000,000 people are moderately or severely burnt each year¹. Injuries represent one of the most important public health problems faced by both developing and industrialized nations today. Injuries may be intentional or non-intentional, but intent is sometimes difficult to determine for injuries such as burns.

Burn injuries constitute a serious medical, social, and psychological problem along with severe economic loss to individual and their family. According to National program for prevention of burn injuries, high occurrence is ascribed to illiteracy, poverty, and low-level safety, and 90% of burn injuries are preventable.² This study was conducted to identify the socio-demographic and socio-cultural aspects of burn patients, to investigate the factors affecting outcome and mortality of burns and to determine the magnitude of the problem of burn among all injuries admitted to the multi-speciality hospital over a period of one year.

MATERIAL AND METHODS-

All burn cases admitted to the burn's unit of Birla Hospital and 2 other private hospital of Gwalior over a period of five years (October 2013 to October 2018) (n = 432). Data regarding sociodemographic profile and outcome of burn patients were recorded on predesigned and pretested questionnaire. Circumstances of the injury: place and time, brief description of the event, agent, associated burning of clothes, patient's and attendants' reaction, first-aid measures taken. Clinical assessment of the wound: site, affected body surface area, degree, depth, severity, complications.

Methodology- The data was obtained by questionnaire-interview with the patients themselves, while in case of children or patients who were not well enough as a result of severe injury, the data was obtained from relatives who attended the unit. For defining the extent of burns we used Wallace's rule of nine and for the paediatrics age group the Lynch and Bolcker (1963) method was applied in which they have differentiated between infants and children. In case of infants, the head, front and back of trunk all represent 20% of the total body surface area, while each upper limb is 10%; when assessing children, they modified the formula:

head, lower limbs and posterior trunk is 15% of the total body surface area, the anterior trunk 20% and the upper limbs each rated 10% of the total body surface area. Depth of burns was divided into first, second and third-degree burns. Burns which involved outer layer of skin along with predominant vascular reaction such as dilatation of arterioles and capillaries which resulted in red, swollen and painful skin without formation of blisters were considered as first-degree burns. Second-degree burns resulted in detachment of epidermis from dermis. While those burns which involved entire skin epidermis and dermis with massive necrosis with stiffened yellowish brown and leathery areas with prominent or dried blood vessels in its floor were taken under third-degree burns.

Statistical Analysis- The recorded observations were analysed using Epi-info software. Results are expressed in percentage with respect to sex ratio.

RESULTS-

Table 1- Sociodemographic Profile of Study Subjects (n=432)

Variables	Males	Females
Number Origin	133 (29)	299 (71)
Urban	63 (42.6)	100 (32.7)
Rural	70 (57.4)	199 (62.3)
Cause		
Accidental	88 (72.1)	195 (65.8)
Suicidal	35 (20.4)	58 (18.2)
Homicidal	10 (7.5)	46 (16)
Mode of injury		
Flame burn	86 (62.3)	265 (87.9)
Stove bursting	52	113
Chimney	22	69
LPG	12	83
Scald	10 (8.2)	19 (6.6)
Chemical*	11 (9.0)	1 (0.4)
Electrical	25 (20.5)	15 (5.1)
Depth		
1st Degree	13 (8.1)	5 (5.5)
2nd Degree	18 (16.3)	100 (34.3)
3rd Degree	102 (75.6)	194 (60.2)
Extent		
0-20%	10 (8.1)	11 (4.1)

21-40/o	19 (15.5)	24 (8.2)
41-60%	35 (20.4)	60 (20.6)
> 60%	69 (56)	204 (67.1)
Mortality		
0-20%	0	0
21-40%	2 (3.0)	1 (0.5)
41-60%	6 (7.6)	17 (7.8)
> 60%	69 (89.4)	195 (91.7)

Table 1- show out of a total of 432 patients, females (70.3%) outnumbered males (29.7%). Out of 133 males 42.6% belonged to an urban area while the rest were from rural areas; while considering the total 299 females, 32.7% belonged to urban areas and the rest 67.3% were from the rural area. Out of total burn patients 67.7% were accidental, which was the most common cause, while the rest of them were homicidal (13.4%) and suicidal (18.9%). In terms of sex distribution, 72.1%, 7.5%, 20.4% males and 65.8%, 15.9%, 18.3% females suffered from accidental, homicidal and suicidal burns respectively. Most of the cases belonged to third-degree burns (64.6 %), while the rest (35.4%) were first and second degree. The extent of burns was classified as 0-20%, 21- 40%, 41- 60% and > 60% of body surface area and corresponded to 8.1 %, 15.5 %, 20.4 % and 56 % in males and 4.1%, 8.2 %, 20.6% and 67.1% in females respectively. Most common age group was found to be 21-30 years in both males and females.

Table 2- Complication and Mortality

Variable	Complication (%)	Mortality (%)
Aspiration pneumonia	80 (17)	60 (13)
Septicaemia	232 (53)	156 (38)
Haematemesis	52 (12)	2 (1)
Both A.pneumonia and septicaemia	89 (20)	51 (14)

Table 2 shows aspiration pneumonia in 13% while combined causes were responsible for 14.0% of deaths. Similarly, septicaemia the major complications in the post-resuscitation phase (53%) while aspiration pneumonia, haematemesis were seen in 16.9%, 12% patients respectively.

Table 3- Outcome of the study subjects

Outcome	Number (%)
Mortality	269 (63)
Contractures	82 (18)
Hypertrophic scar	100 (25)
Amputation	19 (5)

As per table 3 as far as late outcome is concerned after mortality, hypertrophic scar (25%) is the most common outcome. Rest are contractures (18.2%) and amputation (5%).

Discussion-

Burn injuries and their related morbidity, disability and mortality represent a public health problem of increasing importance in developing countries. Economic development coupled with a remarkable decrease in the rate of infectious disease has decreased the morbidity, disability and mortality in such countries.³ Age and sex are important epidemiological determinants for burn injuries. The present study revealed that more than half the cases were aged between 21-40 years, while those aged 40 years and over represented 10.2% of the cases. The age distribution revealed by the present study is similar to that found in other studies.^{4,5} However, the discrepancy between the relatively low percentage of old people in the present study and the higher percentage (16.7%) reported in a previous study⁶ might be explained by the social structure in our setup as older members usually live within the family, thus decreasing their exposure to hazardous situations. As regards sex distribution, the female preponderance in the age group 20-40 years concurs with other reports from developing countries such as India⁷ and Jordan⁸ as well as other Egyptian studies^{9,10} and might be explained by the involvement of females in domestic activities and also dowry deaths. Socio-cultural factors are among the major causes of different sex predisposition of burn injury in developing countries

like India compared to other developed nations. In the present study, most burns were accidental. In the causes of burn injury, flame was the most common agent affecting more than two-thirds of cases, followed by electrical, scald and chemical burns.¹¹ In spite of the finding that scalds were responsible for only 7% burn injuries in this sample, they were found to be the most frequent agent of burn injuries in reports from Japan¹² and Nigeria,¹³ in which they represented 40-78%. Mortality is the most important and most readily quantifiable outcome in burn patients. In the present study, the case fatality rate was 62.4%. The mortality rate is quite high as compared to one of the studies reported in USA.¹⁴ When univariate analysis was used, a higher case fatality rate was observed with factors like young age groups, with flame agent, especially if clothing was ignited, larger body surface area, deep burns, higher degree and if the patients delayed seeking hospital admission. These results are consistent with other reports.¹⁵

Conclusion- This study provides an overview of the most important aspects of burn injuries for hospital. Most deep burns are accidental, seen in middle-aged housewives as a result of flame burns and lead to death. So, measures should be taken to provide proper education to prevent these accidents and ensure safety.

Conflict of Interest- None declared

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