

Epidemiology and Outcome of Burn Patients in the Burns Specialty Center at Al-Diwaniyah Province, Iraq, 2019

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Abstract

Background: The stressful consequences of burns included physical injury, psychological trauma and financial problem not only for the victim himself but also to his family. Burn victims may pass through painful experience until getting improved or unfortunately die from a number of burn associated complications; in addition some of them remain crippled for the rest of their lives. Variations among sociodemographic and cultural characteristics of different nations have variable effects of the outcome of burn injuries.

Aim of the Study: The current study was carried out in order to identify demographic characteristics of burn patients in association with outcome of burn injuries in terms of morbidity and mortality during the year 2019.

Patients and Method: Burns Specialty Center lies in Al-Diwaniyah province, mid-Euphrates region of Iraq. This region is located southern to Baghdad. It is an agricultural Province with a population of approximately 1.5 million. The Burn center is a referral point for burn victims from this region as well as from other mid-Euphrates regions such as Najaf, Babel, Nasiriyah and Simawa. The total number of burn patients admitted to the center during the year 2019 was 411

Results: The present study revealed that the age group 7 to 30 was the most frequently affected group accounting for 42.3 %. With respect to gender, children in the current study showed comparable male and female distribution, but, patients above 6 years of age were more likely to be female than to be male; however, statistical wise the difference was not significant. With respect to circumstances, in the current study home accidents were the most frequent situation of burn injury in which patients were mostly children or adult females. In the current study, the most frequent agent was flame, followed by scald, then electrical and chemical injuries. Mortality rate in the current study was 13.6 %.

Conclusion: domestic injuries dominated the circumstances of burn, adult patients were most likely women, flame and oil were the most commonly encountered agents and occupational injuries were mainly seen in adult males.

Key words: *Epidemiology, outcome, burn, Iraq, Al-Diwaniyah Province*

Introduction

Burns are still among the most frequent kinds of injury, in spite of substantial reduction in its incidence in developed nations, being responsible for a significant proportion of traumatic injuries globally and they are responsible for considerable morbidity and mortality

worldwide^{1,2}. It is estimated, according to WHO reports, that 5 to 10 % of injuries worldwide are due to burns³. Medical authorities have recognized the distressing outcomes of burns and a substantial health budget has been allocated for research works worldwide aiming at reducing or modifying these consequences. The adoption of effective preventive strategies by health authorities

in developed countries has greatly reduced the rate of burns as well as morbidity associating traumatic burn⁴⁻⁶; however, burn injuries continue to represent great proportion of trauma in developing countries including Iraq⁷⁻⁹.

Some forms of burns are accidental and others are intentional; however, deciding the intentional nature of burn injury is often challenging³. The stressful consequences of burns included physical injury, psychological trauma and financial problem not only for the victim himself, but also to his family¹⁰⁻¹². Burn victims may pass through painful experience until getting improved or unfortunately die from a number of burn associated complications; in addition some of them remain crippled for the rest of their lives^{13,14}.

Variations among sociodemographic and cultural characteristics of different nations have variable effects of the outcome of burn injuries^{15,16}. Household setting is by far the most frequent form of burn site because of use of fire in a number of home activities such as cooking or the use of fire for purpose of warming in cold weather or other home related activities in which the misuse of inflammable equipments and tools leads to catastrophic burn injuries; not to forget that some form of home related burns are self inflicted^{17,18}.

The current study was carried out at Burn Specialty Center at Al-Diwaniyah province, Iraq, in order to identify demographic characteristics of burn patients in association with outcome of burn injuries in terms of morbidity and mortality.

Patients and Method

Burns Specialty Center lies in Al-Diwaniyah province, mid-Euphrates region of Iraq. This region is located southern to Baghdad. It is an agricultural Province with a population of approximately 1.5 million. The Burn center is a referral point for burn victims from this region as well as from other mid-Euphrates regions such as Najaf, Babel, Nasiriyah and Simawa. The total number of burn patients admitted to the center during the year 2019 was 411. Reported data included age, gender, residency and occupation. In addition, circumstances of burn injury were also reported including place of injury, time of injury, cause, agent (scald, oil, fire) and brief description of events (accidental or suicidal). Clinical

assessment of burn wound included: site, surface area, degree, depth, severity, complications and final outcome. These data were collected according to a questionnaire form and interview was made with patients themselves or their relatives in children and severely injured patients. Extent of burn injury in adults was done according to Wallace’s rule of nine¹⁹ whereas, lynch and blocker was applied to children. The depth of burn was classified into partial and full thickness burn.

Results

The current study included 411 patients with an age range of 6 month to 80 years and mean age of 23.95 years. The most frequent age group was 7 to 20 years followed by 21 to 30 years ,as shown in table 1. Children under 7 years have almost equal gender frequency, however, women dominated cases above 7 years, as shown in table 2. Most of cases were from rural residency as shown in figure 1. Regarding circumstances, children and women were mostly affected at home while occupation injury as mostly seen in adult men, as shown in table 3. Fire and oil were the most common causative agents, as shown in table 4. Partial thickness was the most frequent type of burn, figure 2 and the most common outcome was cure ,figure 3.

Table 1: Frequency distribution of burn patients according to age

Age (years)	Number of cases	%
≤ 6	151	36.7
7-20”	102	24.8
21-30	72	17.5
31-40	43	10.5
41-50	25	6.1
> 50	18	4.4
Range	6 months – 80 years	
Mean ±SD	23.95 ±16.7	

Table 2: Frequency distribution of burn patients according to age and gender

Age (years)	Total n = 411	Male n = 195		Female n = 216		P
		Number	%	Number	%	
≤ 6	151	79	52.3	72	47.7	0.200 ¥ NS
> 6	260	119	45.8	141	54.2	
Total	411	195	47.4	216	52.6	

n: number of cases; ¥: Chi-square test; NS: not significant at $P > 0.05$

Figure 1: Distribution according to residency**Table 3: Frequency distribution of burn patients according to circumstances of burn injury**

Circumstances	Total n = 411	Female n = 141	Male n = 119	Children n = 151	P
Home	288 (70.1 %)	96 (68.1 %)	41 (34.5 %)	151 (100.0 %)	Reference
Occupation	72 (17.5 %)	5 (3.5 %)	67 (56.3 %)	0 (0.0 %)	< 0.001¥ HS
Unknown, suicidal and others	51 (12.4 %)	40 (28.4 %)	11 (9.2 %)	0 (0.0 %)	< 0.001¥ HS

n: number of cases; ¥: Chi-square test; HS: Highly significant at $P \leq 0.01$

Table 4: Frequency distribution of burn patients according to agent of injury

Agent	Total n = 411	Female n = 141	Male n = 119	Children n = 151	P
Fire, oil	188 (45.7 %)	106 (75.2 %)	55 (46.2 %)	27 (17.9 %)	Reference
Scald	165 (40.1 %)	28 (19.9 %)	17 (14.3 %)	120 (79.5 %)	<0.001¥ HS
Electrical	48 (11.7 %)	7 (5.0 %)	37 (31.1 %)	4 (2.6 %)	<0.001¥ HS
Chemical	10 (2.4 %)	0 (0.0 %)	10 (8.4 %)	0 (0.0 %)	<0.001¥ HS

n: number of cases; ¥: Chi-square test; HS: Highly significant at $P \leq 0.01$

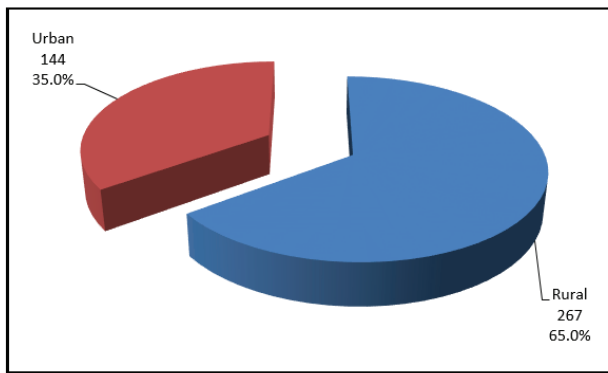


Figure 2: Distribution according to depth of burn

Discussion

Burn injuries and their related morbidity and mortality represent a public health problem of increasing importance in developing countries (20). Epidemiological studies of morbidity are essential for effective burn prevention programs because each population seems to have its own epidemiological characteristics and knowledge of the epidemiology of burns is needed to select target groups for preventive measures. Initial management of burn is very important. First aid measures, like wound cleaning and removal of source of injury significantly improve outcome and reduce mortality and health cost. Age and gender are important epidemiologic determinants of burn injuries. The present study revealed that the age group 7 to 30 was the most frequently affected group accounting for 42.3 %. This high rate among young adults and adolescence may be explained by the fact that they are generally active and exposed to hazardous situations both at home and at work. The second most common age was children under 6 years of age accounting for 36.7 %. This may be attributed to unawareness about the dangerous nature of objects they are playing with. The least frequent age group was >40, and this may be explained by their long stay with their families at home which limits their exposure to hazardous situation and this represents a socio-cultural determinant of burn injury. The frequency distribution of burn patients in the current study is comparable to that obtained by other researchers in Egypt and Pakistan ^{22,23}. The most frequently affected age group in the Egyptian study was 11 to 30 years and that in the Pakistani study was 10 to 30 years, 47.0 % and 55.3 %, respectively. The occurrence of burn injury in a particular age group more frequently than other groups can be attributed to variation in behavioral aspects

dominant in that particular age group. In the present studies, most of patients were from rural inhabitants and this may be due to low socioeconomic status, poor education and less availability of safety measures during cooking. With respect to gender, children in the current study showed comparable male and female distribution, but, patients above 6 years of age were more likely to be female than to be male; however, statistical wise the difference was not significant. The predominance of female patients in burn injuries is a common observation by a number of authors ^{23,24}; however, other authors denied such predominance. Cooking and other domestic activities are the main blamed reason for adult women to outnumber adult men in burn injuries ²². On the other hand socio-cultural characteristic plays an important role in determining gender variation in incidence of burn injuries in developing countries such as Iraq.

With respect to circumstances, in the current study home accidents were the most frequent situation of burn injury in which patients were mostly children or adult females. This finding agrees with the findings of other previous studies in developing countries ^{22,23}.

Occupational burn injury accounted for a minority of patients in the current study and victims were mostly men. On the other hand, burn due to suicidal attempt of unknown reasons and other causes accounted for small fraction of patients' sample in accordance with some previous studies ²³.

In the current study, the most frequent agent was flame, followed by scald, then electrical and chemical injuries. Similar approximate results were recorded by previous authors in developing countries ^{25,26}.

Mortality rate in the current study was 13.6 %. Indeed, the mortality rate in our study is less than that recorded by some previous authors ^{22,24}. On the other hand, significant proportion of our patients has left the hospital against doctor recommendations which may be explained by poor socioeconomic status or by low level of education. The cure rate in the current study was relatively acceptable.

Conclusion

Domestic injuries dominated the circumstances of burn, adult patients were most likely women, flame and

oil were the most commonly encountered agents and occupational injuries were mainly seen in adult males. Therefore, measures such as early and proper medical intervention and wear of flame resistant cloths may reduce both the mortality and morbidity associating burn injuries in our country.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Burns Specialty Center and all experiments were carried out in accordance with approved guidelines.

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