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CLINICAL PRESENTATION AND MANAGEMENT OF BURN: A7 YEAR REVIEW OF CASES IN KING FAHAD HOSPITAL, ALBAHA, SAUDI ARABIA

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Abstract:

Background: *Burns are considered as disfiguring emergency worldwide. In this study, we reviewed the clinical presentation as well as primary management among burn patients who were presented to King Fahad Hospital (KFH)*

Material and Methods*: This is a cross-sectional retrospective study. The cases of burn among patients admitted to (KFH) during the period 2011–2018 were included. Data were analyzed using the Statistical Package for Social Science version 25.*

Results: *A total number of 181 patients were included in the study. Male was the predominant sex which represents 70.2% of all cases, with the male to female ratio of 2.3:1. Most of the participants were below 19 years of age (64.2%). The main causes of burn were flame (59.7%), scald (21.5%), electrical (12.7%), and Chemical (2.8%). 74.6% of patients presented within the first 12 hours. The main presenting symptoms were pain (76.8%), hypovolemic shock (3patients) and compartments syndrome (2patients). Regarding the total body surface area of the body involved 115 cases had less than 20%, 29 cases had between 20% and 39%, and 7 cases had more than 50%. This study showed a statistical relation between body surface area and age group and nationality. Hospitalization was needed for 158 (87.3%) patients. Wound debridement was performed to 11 patients, 4 patients (2.2%) underwent skin graft, and 2 patients had compartment syndrome.*

Conclusion: *Burn injuries are still not uncommon health problem in Al-baha region. Most of the patients are young and they need hospital management and care.*

Keywords: *Burn, Injuries, Clinical presentation, Complication, Management.*

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INTRODUCTION:

Burns are considered to be a form of disturbing trauma worldwide. They often result in significant morbidity that leads to a serious impairment of their emotional well-being, and experienced an overall quality of life [1]. Burns can occur across all age groups; however, the majority of the cases of burns occur among children and older cohorts [2]. The World Health Organization generally defines the causes of burn as: heat (hot objects, gases, or flames), chemicals material, electricity and lightning, friction, or radiation. Risk factors associated with burns include low socioeconomic status, low maternal educational level, as well as the lack of a fully functioning smoke detector.

Moreover, poor quality electrical supply, careless smoking habits, and unsafe storage of inflammable materials are also among the risk factors associated with burns [2]. According to current statistics, burns are directly associated with more than 7.1 million injuries, the loss of almost 18 million disability-adjusted life years, and more than 265,000 deaths [3]. Interestingly, many of the countries with a high-income countries have had decreasing occurrences of burns, coupled with a decrease in the rates of mortality associated with burns. Furthermore, the rate of child mortality from burns is currently over seven times higher in low income countries than in high income countries [4]. However, burns may also occur because of specific social habits and traditional practices, religious activities, as well as traditional medical practices [5]. Over one million and 173,000 people have moderate to severe burn annually in India and Bangladesh respectively. Temporary and permanent disabilities occur in 17% and 18% of children in Bangladesh, Pakistan, Egypt, and Colombia. Five percent of disabilities in rural Nepal was due to burn. Of the 410,000 burn injuries occurred in the USA, 40,000 required hospitalization in the year 2008 [6].

In 2015, the Human Development Reported the average mortality rate of burn was 57 per 1,000 in high income countries, whereas in low and middle income was estimated to be 106 per 1,000) [1]. In Saudi Arabia, 0.3% of the population are known to be impacted by burns [7].

We designed this study with the objective of determining the prevalence of burns among the residents of the region of both sexes, across all age groups, as well as in rural and urban communities. This study also aims to investigate the Clinical Presentation of burns, as well as their causes and initial management. The findings of this study aim to help guide physicians in identifying and targeting primary and secondary preventative therapies.

This study also aims to investigate the Clinical Presentation of burns, as well as their causes and initial management. The findings of this study aim to help guide physicians in identifying and targeting primary and secondary preventative therapies.

MATERIAL AND METHODS:

This is a cross-sectional retrospective study. The cases of burn among patients admitted to King Fahad Hospital (KFH) during the period 2011–2018 were included. King Fahad Hospital is a public hospital with 400 beds 68 of which are assigned for critical care services. The hospital is the main teaching hospital for the college of medicine of Al-baha University. A total number of 212 cases of burn data were reviewed and 31 were excluded because of incomplete information. A prestructured data collection sheet was used to collect data. Components of the case records of all patients with burns admitted to King Fahd Hospital between January 2011 and December 2017 were reviewed. Data, including demographic data (age, gender, educational status, and place of residence), and the characteristics of the burn injury (degree, area, type, and causing agent, presenting symptom, time of presentation, management, and the immediate outcome) was collected. Data were entered and analyzed using the Statistical Package for Social Science version 25. Ethical approval was obtained from the joint committee of Al-baha University Medical School and King Fahad Hospital ethical committees.

RESULT:

A total number of 181 patients were included in this study during the period between January 2011 and January 2018. Sixty-four (35.4%) of them were below 10 years of age, 34 (18.8%) between 10 and 19 years, 32 (17.7%) between 20 and 29, 27 (14.9%) between 30 and 39 years, 15 (8.3%) between 40 and 49 years, and the rest above 50 years.

Male was the predominant sex which represents 127 (70.2%) of all cases, with the male to female ratio of 2.3:1. Hundred and twenty-nine (71.3%) of the participants were single and 50 (27.6%) were married. Hundred and eighty of the cases were residing in Al-baha and only one case from outside the area. Hundred and forty-one (77.9%) of the patients included in this study were Saudi and the rest were from different nationalities. The nationality was found to be significantly affected by age group (*p value* 0.001). About 97.8% of the patients were Muslim. Table 1 showed the basic characteristic of the participants.

The main causes of burn in this study were flame burn which represented in 108 (59.7%) of the patients, followed by scald in 39 (21.5%) and electrical burn in 23 (12.7%). Chemical burn was the etiological factor in 5 cases (2.8%). Hundred and thirty-five of the patients (74.6%) were presented to the emergency service for help within the first 12 hours after they sustained their injury whereas 2 patients presented between 12 and 24 hours. Only 2 cases presented after completing the first 24 hours. The relation between the age of the patients and types of burn were shown in Table 4.

One hundred and thirty-nine of the total number of patients (76.8%) presented with severe pain as the main complaint and we have three patients had hypovolemic shock. Two of the burn sufferer came with compartment syndrome.

Regarding the total body surface area of the body involved by burn process in this study, 74 (40.9%) cases had less than 10%, 41 cases (22.7%) had 10%–19%, 24 (13.3) cases had 20%–29%, 5 (2.8) patients had 30%–39%, and 7 (3.9) cases had more than 50%. The surface area of the body affected was correlated with the age group and nationality and it was found to be statistically significant (*r: 0.218 p: 0.007 and r: 0.266 p: 0.01,* respectively). This relation is shown in Table 5. The parts of the body involved by burn in a descending order upper limb in 61 patients (33.7), trunk in 18 (9.9%), the lower limb in 15 cases (8.3%), the head in 9 cases (5%), and 4 patients (2.2%) had their site affected in the perineum. Thirty-one (17.1%) cases had a mixed type of injuries regarding their body parts involved in the burn process (Table 4). On clinical examination 95 (52.5%) of the patients had blistering and redness on inspection of their burned sites indicating the depth burn.

The depth of burn our patients had in this study in a descending order were as follows: full thickness in nine cases (5%), deep partial thickness in 30 patients (16.6%), and superficial burns in 30 patients (16.6%), and in 70 (38.7%) patients, the superficial partial thickness is the dominating type. Pearson analysis showed significant correlation between the types of burn and age, nationality and gender (*r: 0.317 p: 0.000, r: 0.155 p: 0.04, and r: .281 p: 0.000, respectively*). This relation is shown in Table 5.

One hundred and fifty-eight (87.3%) of the patients presented with burn need hospitalization for further management and 6 patients need fluid resuscitation due to severe types of burn. Of the 181 cases in this study, 2 patients had compartment syndrome as a complication of burn injury to the extremities and 4 patients (2.2%) underwent skin graft as treatment options by plastic surgery department, and 11 patients (6.1%) needed wound debridement.

A part from one patient died as complication of his burn injury, all other burn cases (98.9%) were treated and followed in the hospital. According to the available data none of the patients referred to specialized burn units for further management.

DISCUSSION:

This a retrospective descriptive hospital-based study conducted in KFH in Al-baha city to assess the prevalence, clinical presentation, causes, and initial management of burn among patient attending to King Fahad Hospital. The last study conducted in this hospital was 24 years ago (1994) [8] and therefore we need to reassess the exact extent of the problem. Patients who presented with burn to KFH usually either came directly to the emergency room or referred from primary health care centers. The number of patients presented with burn admitted to the hospital who included in the study was 181. This number is considered to be less than the patients with burn in the last study done in the same hospital by Mustafa et al. in the period between 1990 and 1994 [8], this could be related to the increasing number of hospitals in the region that provide services to patients.

The commonest age group affected by burn was below 19 years of age representing 98 (54.2%) of the total number of cases in this study, the patients below 10 years of age were found to be 64(35.4) % of all patient and these findings regarding this point are consistent with local Saudi Arabia findings as seen in the studies done in Al-baha and Eastern Saudia Arabia [8, 9] as well as international literature [10, 11]. The male to female ratio was 2.3:1 with male being the commonly affected by burn and this agreed with the local literature [8] as well as international studies [12]. This finding is true for all age groups included in the study, the only exception was the above 50 years where all patients were male. In contrast to this finding, a study done in Madinah on 2017 showed the female as the predominating sex [2].

Because the study takes place in Saudi Arabia, the commonly affected patients in relation to the nationality were expected to be Saudi people in all age groups and that was the findings in this study. The only exception is the age group between 30 and 39 where both Saudi and non-Saudi patient were

almost equal (14 and 13, respectively). This could be justified by the presence of large number of non-Saudi employee and laborers in this age group. This is almost same to the finding in the last study done in Al-baha [8].

Flame was the commonest causative agents of burn in this study in all age groups followed by scald. These findings are inconsistent with studies done previously in Medina and Al-baha which showed the reverse as the scald was the commonest cause of burn followed by flame [2,8]. But this finding is similar to the study done by Soleimani et al. [13] This can be explained by the fact that gas cylinder is used at home as the main source of energy for cooking. Other causes of burn like electrical burn are almost the same in all age groups. Chemical burn was the fourth common type of burn in our findings and patients between 20 and 29 years were the most affected age group. This is similar to the local literature [14].

In our study, the severity of burn injury when related to the surface area of body parts involved was considered to be mild in severity as most of the patients (63.6%) have less than 20% of their body affected by burn process. These findings were similar to local [2] as well as international literature [12].

There was a significant correlation between the age groups of the patient affected by burn and the surface area involved. Regarding the part of the body involved, we found that 42% of individual burned in the upper and lower limbs. This is similar to the study done in Al-baha [8], but study done in Medina showed that that more than 90% of the patients got their burn in the periphery of their bodies [2].

As per clinical examination of the burn wounds when the patients were received in the emergency room, the less severe types of burn (Superficial and superficial partial thickness) were the commonest types seen in our study as compared with more severe type of burn like full thickness burn and these findings were similar to the study done in UK [12].

There was good outcome as shown by our data in this study for patients presented with burn in King Fahad Hospital despite the fact that there is no separate burn unit. Other important predictor of the outcome is that some of our patients got benefit from post burn management at plastic surgery unit in form skin graft as a modality of treatment. From the studied patients only one patient died from the complication of burn. This will be considered as a good outcome seen in our study.

Table1:Factors shows the basic characteristic of participants n= (181)

	Character	Frequency	Percentage
Sex	male	127	70.2
	female	54	29.8
Age	<10 years	64	35.4
	10-19 years	34	18.8
	20-29 years	32	17.7
	30-39 years	27	14.9
	40-49 years	15	8.3
	>50 years	9	5.0
Marital Status	single	129	71.3
	married	50	27.6
Nationality	Saudi	141	77.9

Table 2: Factors shows the relation between the age group and the type of burn.

Type of Burn	<10 years	10-19 years	20-29 years	30-39 years	40-49 years	>50 years	Total
Scald	22	9	5	2	0	1	39
Flame	38	21	18	16	9	6	108
Electrical	4	3	4	7	3	2	23
Chemical	0	0	3	1	1	0	5
Others	0	0	1	0	1	0	2
Total	64	33	31	26	14	9	177

Table 3:Factors shows types of burn ,depth and the immediate outcome

	Character	Frequency	Percentage
Types of burn	Scald	39	21.5
	Flame	108	59.7
	Electrical	23	12.7
	Chemical	5	2.8
	Others	2	1.1
The depth of burn	Superficial	30	21.6
	Superficial partial thickness	70	50.4
	Deep partial thickness	30	21.6
	Full thickness	9	6.5
Out come	treated & discharged and followed up	179	98.9
	Died	1	0.6

Table 4: Factors shows the time of presentation, the percentage of burn and body part involved

	Character	Frequency	Percent
Time of presentation	<12 hours	135	74.6
	12-24 hours	2	1.1
	.24 hours	2	1.1
	more than 24hours	3	1.7
Total body surface area of burn	<10%	74	40.9
	10-19%	41	22.7
	20-29%	24	13.3
	30-39%	5	2.8
	>50%	7	3.9
Body part involved	UL	61	33.7
	Trunk	18	9.9
	LL	15	8.3
	Head	9	5.0
	Perineum	4	2.2
	Mixed	31	17.1

Table 5 : Factors shows the relation between the age ,gender and nationality

Character		Type of Burn	Total body surface area of burn
Age	Pearson r	.317**	.218**
	p	.000	.007
Gender	Pearson r	-.155*	-.119
	p	.040	.144
Nationality	Pearson r	.281**	.266**
	p	.000	.001

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