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MORTALITY FROM BURNS IN ZARIA: AN EXPERIENCE IN A DEVELOPING ECONOMY
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MORTALITY FROM BURNS IN ZARIA: AN EXPERIENCE IN A DEVELOPING ECONOMY

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ABSTRACT

Objective: **To determine the cause of morbidity and mortality in burns patients managed over a period of eight years in our hospital.**
Design: **A retrospective study.**
Setting: **Ahmadu Bello University Teaching Hospital.**
Subjects: **Two hundred and seven patients admitted and treated for burn care between January 1980 and August 1987.**
Results: **There were 114 males and 93 females with male/female ratio 1.2:1. Fifty four percent of the admissions occurred during the harmattan period, which is cold and dry season of November to February, 52% of admissions were children below the age of five years. The severest injury was caused by petrol burn with a mean % BSA of 53 and range 23-100. Scalds accounted for 39% while flame accounted for 57% of the injuries. Clothing injury was a cause of extensive burns accounting for 12% of burn injury with % BSA of 36. Complications leading to morbidity and mortality include, wound infection leading to septicaemia and septic shock, hypovoleamia with hypovolaemic shock, which gave a mortality of 100% of those who developed shock state. Seventy three patients died giving a crude mortality rate of 35%.**
Conclusions: **There is a need for health education to reduce incidence of burn injury. Since burn injuries are largely preventable, it is important to define clearly, the social, cultural and economic factors, which contribute to burn causation in order to combat them effectively.**

INTRODUCTION

Domestic accidents contribute immensely to the epidemiology of burn in most developing countries and the situation is similar in our experience in Zaria (1,2). It is an important public health problem due to adverse socio-economic conditions prevailing.

Since man first learned to make fire, burns have become one of his most common and severe injuries. The difficulties in the treatment of burns have been lamented by all writers for centuries. The earliest information regarding burn injury is found in the old testament (Leviticus 13:24-28) where burn injuries is listed among the dermatological illnesses ("On the history of the treatment of burns") (3). Management of burns has undergone many metamorphosis since earliest times to modern day treatment, all in an attempt to reduce morbidity and mortality (4). Our socio-economic states in the developing world has made it difficult to significantly do this. The cooking fire has become a functional part of the household like any piece of furniture. The children are not afraid of it. They hover around it, they eat around it and they play around it (5). Cooking is at floor level. This makes women and children more vulnerable. In Nigeria, petrol burns during the scarcity of petrol has been causing havoc through the years from 1980 to date (6). The purpose of this study is to look into the contributing factors leading to high morbidity and mortality in our environment and form basis for future study and to look at measures for not only prevention but how to reduce morbidity and mortality when it occurs.

MATERIALS AND METHODS

This is a retrospective study of two hundred and seven patients admitted for burn care from 1980 to 1987. Three hundred and fifty folders were retrieved. Two hundred and seven had enough information for the purpose of the study. Activities leading to the burn injuries, complications, outcome of treatment and mortality were studied in detail including age and extent of injury in relation to mortality.

RESULTS

The study period covered January 1980 to August 1987. There were 114 males and 93 females a ratio of M.F of 1.2:1. One hundred and twelve of the admissions (54%) occurred during the harmattan period which is a cold and dry period (Figure 1). Fifty two percent of the admissions were children below the age of five years (Table 1). The age and sex distribution and the type of burn is illustrated on Table 2. Looking into the activities leading to the cause of burn; scalds (hot water etc) and flame were the major aetiological factors with scalds the most common injury among children. Clothing and petrol fire have caused extensive injuries with a mean percentage body surface areas (%BSA) of 36% and 53% respectively. Only 27% (56 patients) arrived in the hospital within six hours of injury despite the fact that 51% of the patients were urban dwellers most of whom were within Zaria. The most common complication was burn wound infection, which occurred in 97 patients (this aspect has already been published). Seven patients had amputations due to severe limb injuries, which were deep.

Shock state developed in 46 patients 31 of whom were due to hypovolaemia and 15 septicaemic shock. Hypovolaemic shock developed within 24-48 hours of admission due to inadequate fluid replacement and non-availability of supplies while septicaemic shock developed a week or two after admission. The systolic blood pressure ranged from 70-80mmHg and diastolic from impalpable to 60mmHgh with a pulse rate ranging between 70-140/minute.

The respiratory rate was on the average 38/minutes with temperature in septic patients ranging from 38°C to 40°C. The extent of injury in these patients with shock state ranged between 25-100 BSA.

Outcome of management: Seventy two patients died in this hospital, Table 3 relates the percentage body surface area to the outcome.

Figure 1
Seasonal frequency

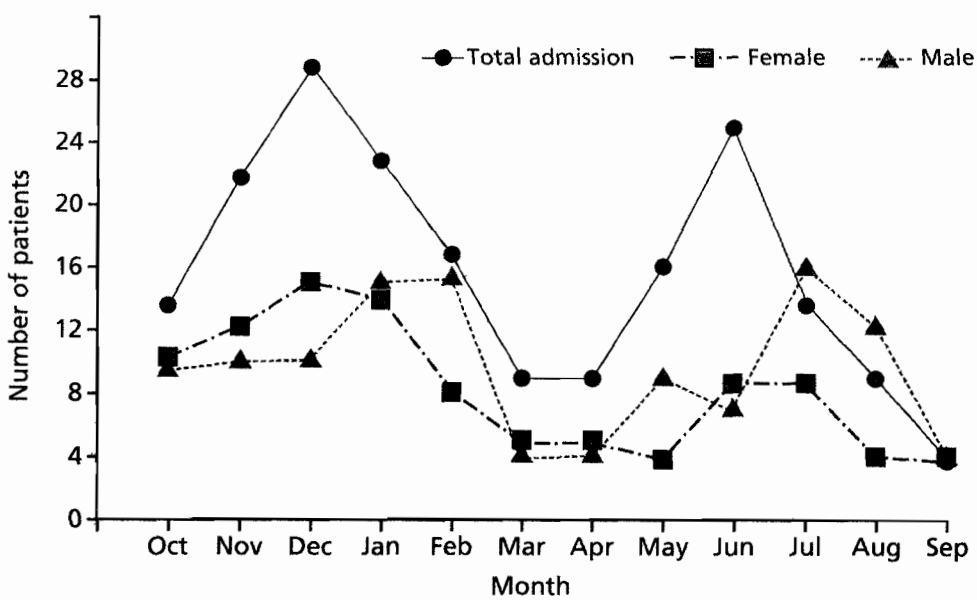

Table 1

Age distribution and type of burns

Age (years)	Type of scald	Burns flame	Others	Total	(%)
0-4	68	39	1	108	52
5 and older	18	73	8	99	48
Total	86	112	9	207	100

Table 2

Type of burn: Age and sex distribution

	Scald		Flame		Electrical		Chemical		Not stated		Total
Age (years)	M	F	M	F	M	F	M	F	M	F	
0-4	46	22	16	23	-	-	-	-	-	-	107
5-9	2	3	4	7	-	-	-	-	1	-	17
10-14	-	1	4	5	-	-	-	-	-	1	11
15-19	-	3	4	2	-	-	-	-	-	-	9
20-24	1	1	5	1	-	-	-	-	-	-	8
25-29	1	3	6	7	2	-	-	-	-	-	19
30-34	-	1	6	6	1	-	-	-	1	-	15
35-39	-	-	4	-	-	-	1	-	-	-	5
40-44	1	-	0	1	-	-	-		1	-	3
45-49	-	-	1	1	-	-	-	-	1	-	3
50-54	-	-	2	1	-	-	-	-	-	-	3
55-59	1	-	1	1	-	-	-	-	-	-	3
60+	-	-	1	2	-	-	-	-	-	-	3
Not stated	-	-	-	1	-	-	-	-	-	-	1
Total	52	34	54	58	3	-	1	-	4	1	207

Table 3

Outcome

BSA	Total No. of cases	Died	Discharged	Absconded	Transferred	Not stated
1-20	100	5	78	14	2	1
21-40	62	27	29	5	1	
41-60	19	17	2	-	-	-
61-80	8	7	1	-	-	-
81-100	14	14	-	-	-	-
Not stated	4	2	2	-	-	-
Total	207	72	112	19	3	1

DISCUSSION

It can be seen from the above results that the mortality rate of 35% is very high. Children constituted a large percentage of those involved. Those below the age of five and more especially those below the age of two faired badly. This is due to the immature immune system and their organs like the liver and kidney are not developed enough to deal with high solute load in burn (7). Forty percent of the deaths occured below five years while 56% occurred above that age group. There were fewer deaths below 50 years and above the age of 30 compared with the younger age group and proportions of those above 60 years of age with similar extent of injury. Above the 60 years, one of the three patients died, giving a mortality rate of 33%.

When mortality was related to causes, 14 of the 86(16%) patients who had scald injury died while 54 (48%) of the 112 patients who had flame injury died. Analysing this further, hot water caused 17% of the deaths (12/68) of those with hot water injury.

Of those whose clothing caught fire eight of the 24 (33%) died. All these caused extensive injury. Also among those who died were 10/20 of those who had petrol burns (50%) four of the 16 (25%) who had bed side fire, nine of the 16 (56%) who had been involved in vehicle accidents. Clothing burns usually cause extensive burns (8). Modification of fabrics especially nightgown can help to reduce the incident and severity of injury (9). Cooking at floor level, which is common in our environment is due to low socio-economic status. This has contributed to the scald injury and thus children who usually hover around are easily burnt.

Mixture of kerosene with petrol and vice versa has caused a lot of havoc over the years (6). Government legislature to prevent this happening can go a long way. Petrol burns in this study contributes to the severity of burn injury and therefore the mortality. Looking at the table of outcome, the extent of burns injury correlate very well to mortality. Children that have more that 20% and adult that had more than 40% burns did not fair well. The delay in arrival in the hospital as well as the age of the patients (below four years and above 60 years of age) contributed to the severity of injury and the mortality. In addition, luck of supplies for prompt resuscitation and subsequent management did not help matters (10). Definitely increase with the activity with use of fire during the cold and dry harmattan period cannot be ignored.

In conclusion, burn injury is a common problem in Zaria. The harmattan period increases the activities with the use of fire. Petrol, kerosene and clothing burns caused severe injury and contributed to mortality. The socio-economic status of our people did not help matters. Children and women bear the brunt. There was high mortality among those below 4 years and those above 60 years of age. Morbidity and mortality was due to hypovalaemia and septicaemia. There is a need for health education towards the prevention of burn injury. The socio-economic states of our people need to be improved so that there is improved architectural design of all habitats and elimination of cooking at floor level. The hospital supplies needs improvement. The severely burnt needs an isolation wards as patients are currently managed in open wards with other surgical patients, this can control wound infection. These measures if taken will improve the outcome and decrease morbidity and mortality.

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