

Burns injuries among in-patients at Moi Teaching and Referral Hospital, Eldoret, Kenya

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Abstract

Background: Africa contributes 12.2% to the total global deaths due to burn injuries. There are no data on burns in the Western region of Kenya

Objectives: To determine the causes and outcome of burns injuries among in-patients at Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya.

Study design: Retrospective Cross-sectional study.

Setting: The surgical wards of MTRH, an 800 bed tertiary teaching and

referral hospital in the Western region of Kenya.

Results: The age ranged between 4 days and 79 years (mean 7.9±13.7 years). The male to female ratio was 1.5:1. The common causes of burn injury were scalds and open fire. The mean duration of hospitalization was 25.7 ±33.5 days (Range 1 to 256 days). The mortality rate was 5%.

Conclusion: Scalding is the leading cause of burns at MTRH. The length of hospitalization and mortality rate are comparable to those of the developing world.

Introduction

Burn injuries cause significant morbidity and mortality, both in developing and developed countries (1) and have considerable physical, psychological and economic effects on the patients, their families and the society. Burns account for over 1% of the global burden of diseases among major injuries (2, 3). Africa contributes 12.2% to the total global deaths due to burn injuries (4).

Burns literature in Kenya in general is scanty. There are no data on burns in the Western region of the country. Moi Teaching & Referral Hospital (MTRH) is the main referral facility for this region. This study evaluated the causes, length of hospitalization and the outcome of management of burns at MTRH.

Methodology

This was a retrospective cross sectional study conducted among in-patients at MTRH between 1st January, 2006 and 31st March, 2008. Three hundred and two patient files were studied and data on patient demographics, cause of burn injury, site of the burn, percentage and depth of burnt surface, duration of hospital stay and treatment outcome were extracted.

Means and standard deviations were used to report continuous variables while percentages and frequencies were reported for categorical variables. Correlation was drawn between the percentage of burnt surface area and age with length of hospitalization. Age and length of hospitaliza-

tion were also correlated with outcome of management. The inferential statistics were considered significant at p value level of less than or equal to 0.05.

Results

Demographic characteristics

The ages ranged between 4 days and 79 yrs with a mean of 7.9 (SD 13.7) years. Males were 179 (59.3%) with a mean age of 7.8 (SD13.1) years while females were 123 (40.7%) and had a mean age of 8.3 (SD14.7) years. Children below 5 years were 221 (73.4%) and had a mean age of 1.9 (SD 1.3). Those older than 5 years were 80 (26.6%) and had a mean age of 27.8 (SD18.1) years.

Site of injury

Most of the patients sustained burns in more than one site. Upper limbs with 121 incidents (25.5%) were most involved while the least was inhalational burns (Table 1).

Causes of the burn injuries

Scalds were the leading cause and accounted for 204 (67.5%) of the burn injuries. This was followed by open fire with 79 injuries (26.2%). The least common cause was chemical injury. Table 2 shows the causes of burn injuries as seen in MTRH in relation to gender, occupation and surrounding circumstances.

Length of hospitalization

The hospital stay ranged from 1 to 256 days with a mean of 25.7 days (SD33.5).

On average female patients were hospitalized longer (28.7days) than male patients (23.6 days) (t-test, p=0.21). The length of hospitalization was positively correlated to the age of the patients (r=.27, p<.001), but not to the percentage of burns (r=.099, p>0.05).

There was an association between length of hospitalization and causes of burns (F-test, p<0.001) and also with the presence of co-morbidities (F-test, p<0.037) (table 3).

Outcome of treatment

Fifteen patients died (mortality rate 5%). Ten were males. All deaths occurred in those with major burns. Open fire accounted for 80% of the deaths with the rest being due to scalding (Table 4). Patients who were discharged had a lower percentage Total Burn Surface Area (TBSA) (14.3%) than those who died (41.4%) (p<0.001).

Discussion

In this study, children under 5 years had the highest risk of burn injuries, possibly because children are curious and ignorant of the dangers posed by fires and hot liquids. This finding, while consistent with studies done elsewhere in the world (5-14), may reflect the dangers of unattended child care in our settings. As in the other studies, male children recorded a higher incidence (3,5,9,15). The reason could be because male children are more playful and explorative than female children.

Scalding, responsible for 67% of the total number of cases, was the leading cause of burn injury at MTRH. Studies done in United Kingdom, the Americas, Europe and Africa (5,8,15) had similar findings. The significance of open fire in this study is in the fact that most households within the catchment area use firewood for cooking.

The length of hospital stay is a concern for many hospitals and burn units because of its impact on costs. The mean hospital stay of a burn injury patient in MTRH was 25.7 days. This length of stay is perhaps longer compared to developed world countries (7) because of technology and supporting infrastructure. The factors found to determine the duration of stay were age, cause of burn and presence of co-morbid conditions.

As in this study, co-morbidities increase the risk and complications of burn injuries, and thus not only lengthen

Site of the burn	Count	%
Head/ Neck/shoulders	97	20.4%
Upper limbs	121	25.5%
Trunk	117	24.6%
Gluteus/Groin	60	12.7%
Lower limbs	79	16.6%
Inhalation(Internal)	1	0.2%
Total	475	100.0%

Table 1: Site of injury in the body surface area

Variables	Scalds	Open fire	Contact	Electricity	Chemical	Total
Sex						
Male	126	42	6	4	1	179
Female	78	37	4	2	1	122
Total	204	79	10	6	2	301
Nature						
Accidental	197	66	10	6	2	281
Assault	5	11	0	0	0	16
Suicidal	1	2	0	0	0	3
Total	203	79	10	6	2	300
Occupation						
Children	187	40	7	2	0	236
Students	7	12	3	1	0	23
Housewife	5	6	0	1	0	12
Others	6	18	0	2	2	28
Total	205	76	10	6	2	299

Table 2: Causes of burns in relation to sex, nature and occupation

the stay in hospital but also worsen the overall prognosis for the patient (12).

The mean percentage of body surface area burnt in this study was 16.4%. This is insignificantly higher than in the United States of America with an average of 13.1% (10) and may be indicative of our bigger burden in the extent of burnt surface area. Patients who died had a mean of 40% TBSA compared to 14.3% for those who survived. The mortality rate of burn injuries in MTRH was 5%. This is comparable to studies done in Africa (range of 3% to 17%), higher than in studies done in Europe and America (0.9%- 4.5%) and lower compared to reports from Asian countries (7.2% to 9.5%) (3,13,15). This signifies an unexplored potential to do better in the management of our burns patients by improving our facilities.

In conclusion, scalding is the leading cause of burns at MTRH. The length of hospitalization and mortality rate are comparable to those of the developing world. To address the better care of burn patients in MTRH, creation of a burns unit is recommended.

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Lelei, L. K, Chebor, A. K, Mwangi, H. R

Variables				
N	Mean	LOS in days		p-value
Sex	Female	123	28.7	0.21
	Male	179	23.6	
Age	<5 years	221	22.6	<0.001
	> 5 years	80	34.9	
Cause	Scalds	204	17.6	<0.001
	Open fires	79	46.7	
	Chemicals	2	6	
	Electrical	6	28	
	Contact	10	31.8	
Severity	< 10% TBSA	47	15.5	0.21
	10%-19% TBSA	66	23.5	
	20% -39% TBSA	43	33.1	
	Above 40%	9	20.3	
Co morbidity	Psychiatric	4	50.5	0.037
	Epilepsy	5	56.6	
	No co morbidity	293	24.9	

Table3: The relationship between the length of hospitalization in days with age, sex, causes, severity and co morbidity

Variable		Outcome		
		Alive	Died	Total
Sex	Male	169	10	179
	Female	118	5	123
	Total	287	15	302
Cause	Scalds	201	3	204
	Open fires	67	12	79
	Contact burns	10	0	10
	Chemical burns	6	0	6
	Electricity	2	0	2
	Total	286	15	301
Age	<5 years	213	8	221
	5 < 15 years	33	1	34
	15 < 25 years	13	3	16
	25 < 35 years	14	1	15
	35 < 45 years	3	1	4
	> 45 years	11	0	11
Total	287	14	301	
Severity	< 10%	47	0	47
	(10% < 20%)	66	0	66
	20% < 40%)	36	7	43
	> 40%	3	6	9
	Total	152	13	165
Pre condition	With co morbidity	7	2	9
	without co morbidity	280	13	293
	Total	287	15	302

Table3: The relationship between the outcome with age, sex, causes, severity and co morbidity

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