

Epidemiological patterns of wounds in Kenya.

A cross sectional study

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Case Report

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Background

Wounds impose a significant and often underappreciated burden to the healthcare system and society as a whole. In their treatment, knowledge of the epidemiologic pattern is necessary. There is little knowledge about the epidemiological pattern of wounds in Kenya.

Objective

The aim of this study was to determine the epidemiologic pattern of wounds in Kenya

Materials and Methods

A multicenter cross-sectional survey was carried out over a period of 2 weeks in select regional hospitals in Kenya. Patients who presented with wounds and healthcare providers across the select hospitals completed a wound care study questionnaire that captured wound etiology, duration of wound, and surgical intervention.

Results

The most common cause of wounds was trauma (38.6%), burns (16.2%), and post-surgical wounds (9.8%). The majority of patients with wounds (68%) were inpatient whereas 32% were outpatient. The mean age was 35 years with a range from 0 to 94 years. 55.8 % were male whereas 44% were female.

Conclusion

The majority of wounds in Kenya can be attributed to preventable causes, with trauma, burns, and post-surgical wound sepsis contributing to the largest proportion. Prompt and appropriate management of such wounds would thus reduce the wound disease burden in the country. It is essential to address the prevention of trauma and burns within the country while simultaneously enhancing training programs for the management of post-surgical wounds. Additionally, it is imperative to explore the factors that contribute to the occurrence of post-surgical wound sepsis.

KEYWORDS: Wounds, trauma wounds, burns.

A wound is defined as a break in the epithelium resulting in the loss of the protective lining, thus predisposing to infection. Wounds can be classified as acute or chronic, tidy or untidy, surgical or traumatic. They could further be classified as Lacerations, Puncture wounds, Abrasions, Bruises, or Contusions (1). Surgical wounds are caused by surgical intervention to either manage or treat surgical-related conditions. They are further classified as clean, clean-contaminated, contaminated and dirty(2,3).

An acute wound progresses through the stages of healing as expected and typically heals in less than 4 weeks. On the other hand, a chronic wound is defined as one that has failed to proceed through an orderly and timely reparative process to produce anatomic and functional integrity within three months(4,5). A wound that has failed to reduce

in size by 30 to 40% in a month is likely to be chronic(4,5).

Aetiology varies but the common types of chronic wounds include diabetic wounds, venous ulcers, arterial ulcers, pressure ulcers, malignant wounds, and sickle cell ulcers.

A few studies have been done in Nigeria and Egypt. In Nigeria, a study done to assess the point prevalence of patients with chronic wounds revealed that they constituted 31.55% of the total patients in the hospital. A study from Egypt, on the other hand, reported a setting-specific prevalence of diabetic wounds and not the general prevalence and as such can't be used to know the general population of patients with chronic wounds in that country(6).

In Kenya and the East Africa region, no studies have been conducted to elucidate the

Variables	Total (N=500, %)
Gender, n (%)	
<i>Male</i>	275 (55.8)
<i>Female</i>	217 (44.0)
<i>Prefer Not to say</i>	1 (0.2)
Age, mean (sd)	35.00 (19.50)
Age category(yrs), n (%)	
<i>0 to 5 yrs</i>	41 (8.5)
<i>6 to 18 yrs</i>	45 (9.3)
<i>19 to 60</i>	348 (72.0)
<i>Above 60 yrs</i>	49 (10.1)
Level of Education, n (%)	
<i>Primary</i>	187 (38.5)
<i>Secondary</i>	162 (33.3)
<i>Tertiary</i>	66 (13.6)
<i>Did not attend school</i>	71 (14.6)
Occupation, n (%)	
<i>Employed</i>	127 (26.2)
<i>Self-employed</i>	223 (46.1)
<i>Student/Child</i>	82 (16.9)
<i>Un-employed</i>	52 (10.7)

Table 1. Patient demography.

epidemiological pattern of wounds, making it difficult to identify appropriate interventions. This study aims to address this gap.

Methods

A multi center, descriptive cross-sectional study was carried out over 2 weeks in select regional hospitals in Kenya.

All patients, irrespective of age or gender, who gave consent to participate were included in the study. Patients who were brought in, in critical conditions were excluded to not interfere with their management.

A wound care questionnaire was used to collect data from patients who presented with wounds in the select hospital for 2 weeks. The data included wound etiology, duration of wound, and surgical intervention.

Data from the questionnaires was coded and input into SPSS (IBM version 21). Means, modes, and medians were calculated. Student t-test was used to analyze gender differences in the prevalence, types of

wounds as well as management. Analyzed data was presented in charts and tables.

Ethical approval was sought from the Kenyatta National Hospital /University of Nairobi Ethics and Research Committee. Additional approval was sought from the hospital administration before data collection. An informed consent was also sought from all participants. Information obtained from the study was treated with confidentiality and only for purposes related to the study.

The study was facilitated by the Wound Care Society of Kenya (WCSK) and the Kenya Society of Plastic, Reconstructive, and Aesthetic Surgeons(KSPRAS)

Results

During the 2 weeks, healthcare professionals who collected the data sampled 500 patients in select regional hospitals in Kenya. The distribution of the patients is shown in the figure 1 below

Demographic Characteristics of the study population

Up to 56% (275/493) of the survey population were males. The mean age was 35.0 years (sd:19.5 years) ranging from 0 to 94 years. The majority 72.1 % (348/483) of the patients fell between 19 to 60 years old. The distribution of patient education levels was as follows: 38.5% (187/486) had a primary level of education, 33.3% (162/486) had a secondary level, 13.6% (66/486) had tertiary education, and 14.6% (71/486) had no formal schooling. Details of the demographic distribution are shown in Table 1 below

Patient clinical characteristics

Cause of the wound

The majority of the wounds in the study were attributed to trauma, accounting for 38.6% (193 out of 500). Burn wounds ranked second at 16.2% (81 out of 500). It is noteworthy that post-surgical wounds came in third at 9.8% (49 out of 500). The distribution of other wound types is shown below in Table 2.

Comorbidities

In the study, 29% of the patients (145 out of 500) were found to have a comorbidity. Among these comorbidities, 10.4% (51 out of 492) were diagnosed with diabetes mellitus, 12.2% (60 out of 492) with hypertension, 3.3% (16 out of 492) with HIV, and 6.1% (30 out of 492) with cancer.

Duration of the wound	Total (N, %)	<4 weeks (n=256,51.3%)	1 to 3 months (n=112,22.4%)	3 to 6 months (n=48,9.6%)	6 months to 1 year (n=27,5.4%)	1 to 2years (n=29,5.8%)	2 to 5 years (n=16,3.2%)	5 to 10 years (n=6,1.2%)	>10years(n=5 ,1.0%)	P-value
Cause of the wound										0.001
Trauma	193(38.7)	112 (43.8)	52 (46.4)	8 (16.7)	9 (33.3)	7 (24.1)	3 (18.8)	1 (16.7)	1 (20.0)	
Burns	81 (16.2)	44 (17.2)	15 (13.4)	16 (33.3)	1 (3.7)	3 (10.3)	1 (6.3)	1 (16.7)	0 (0.0)	
Post-Surgical Wound	49 (9.8)	35 (13.7)	6 (5.4)	2 (4.2)	2 (7.4)	3 (10.3)	0 (0.0)	1 (16.7)	0 (0.0)	
Sepsis										
Diabetic Wounds	31 (6.2)	8 (3.1)	11 (9.8)	7 (14.6)	2 (7.4)	1 (3.4)	1 (6.3)	1 (16.7)	0 (0.0)	
Malignant ulcers	26 (5.2)	1 (0.4)	5 (4.5)	5 (10.4)	6 (22.2)	3 (10.3)	5 (31.3)	0 (0.0)	1 (20.0)	
Pressure Sore	18 (3.6)	8 (3.1)	3 (2.7)	4 (8.3)	0 (0.0)	1 (3.4)	1 (6.3)	1 (16.7)	0 (0.0)	
Infective Wounds	16 (3.2)	4 (1.6)	10 (8.9)	2 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Caesarian section	16 (3.2)	16 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Venous Wounds	15 (3.0)	0 (0.0)	1 (0.9)	2 (4.2)	3 (11.1)	4 (13.8)	2 (12.5)	1 (16.7)	2 (40.0)	
Post caesarian section	14 (2.8)	14 (5.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
wound										
Postmalignancy	9 (1.8)	2 (0.8)	1 (0.9)	0 (0.0)	1 (3.7)	3 (10.3)	1 (6.3)	0 (0.0)	1 (20.0)	
Sickle Cell Wounds	4 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.7)	2 (6.9)	1 (6.3)	0 (0.0)	0 (0.0)	
Others	27 (5.4)	12 (4.7)	8 (7.1)	2 (4.2)	2 (7.4)	2 (6.9)	1 (6.3)	0 (0.0)	0 (0.0)	

Table 2. Duration of Wound vs Cause of the wound

Tetanus toxoid vaccination status

A majority of the patients, 82.6% (408/494) had received immunization against tetanus while 17.4% (86 out of 494), remained non-immunized.

Duration of wounds

Among the patients in the study, 51% (256 out of 499) presented with acute wounds lasting less than 4 weeks. Another 22% (112 out of 499) exhibited wounds persisting for a duration of 1 to 3 months. The breakdown of the duration of wounds for the remaining patients is also shown in Table 2.

Discussion

Wounds pose a significant public health challenge, yet there is limited understanding of the actual profile of wounds, particularly in developing countries. In a systematic review conducted by Martinengo et al to estimate the global prevalence of wounds, it was found that 82% of the publications examined were from developed countries. Strikingly, only three articles from developing countries were identified, and none of them were included in the analysis(6). This highlights a substantial gap in our knowledge regarding the prevalence and characteristics of wounds in developing nations. The majority of the wounds documented in the reviewed literature were identified as chronic wounds, primarily arising from underlying non-communicable diseases such as diabetes, hypertension, and chronic venous insufficiency.

The spectrum of wounds in many developing countries remains largely unknown. Common types of wounds that lead to prolonged hospital stay include pressure ulcers, diabetic wounds, venous leg ulcers, ischemic wounds, and post-traumatic wounds(7,8). In addition to these types, trauma, burns, and specific wounds such as sickle cell ulcers and infective courses

may contribute to a substantial proportion of the overall wound burden(9–11).

Our study revealed a different profile, with the majority of wounds being acute (51%). Mechanical trauma emerged as the leading etiology, accounting for 38.6%, while burns constituted the second most common cause at 16.2%. Notably, most of the chronic wounds were found to stem from inadequately managed acute wounds. Our findings align with a study conducted in West Africa, where mechanical trauma, burns, and infectious causes dominated wound etiology. In that study, a major proportion (70.7%) of wounds were acute, and chronic wounds were primarily attributed to poorly treated acute traumatic wounds, deviating from the traditional causes seen in developed countries. Recognizing this trend suggests that preventing chronic wounds in developing countries could be achieved through effective management of acute wounds. Importantly, the majority of acute wounds in our study were attributable to preventable causes.

Our study found a higher prevalence of wounds in males (56%) compared to females (44%). This finding contrasts with the trends observed in most studies conducted in developed countries, where wounds were more prevalent in women (ranging from 53% to 68%). However, it is worth noting that a study from China reported a higher prevalence among men (64%)(6).

The median age in most studies in the developed world reported rather similar mean/median ages of patients suffering from wounds (around 70–80 years of age), with the exception of one study from Egypt on the prevalence of diabetic foot ulcers that reported a mean age of 50 years(12). Elderly patients are more likely to have chronic diseases such as diabetes and heart disease that impair circulation and oxygenation while wound care patients with dementia have a decreased ability to participate in their healing, depending on the extent of their condition. They may be unable or unwilling to comply with their physician’s treatments; or, they may be unable to

adequately communicate with their healthcare providers. However, our study found the mean age of our sample population to be 35.0 years (SD: 19.5 years). This value was similar to a Nigerian study where the majority of the patients were in their third to fifth decades of life with a mean age of 34.51 (SD17.99). Another study from Ivory Coast also showed prevalence was highest at 28.6% among school-age children between 5-15 years.

Loeffler et al projected post-surgical wound sepsis in Africa to be about 25% (10). The majority of the wounds are thought to be a result of poor surgical practices and the unavailability of trained medical personnel. Our study brought out post-surgical wound sepsis as the 3rd cause of acute wounds at 9.8 %. This could also be a result of poor surgical practices in handling of surgical wounds as demonstrated by Loeffler et al.

Conclusion

Our study unveiled a distinct epidemiological pattern of wounds in comparison to developed countries. In contrast to the developed nations, where traditional causes are the primary etiology of chronic wounds, we observed that a majority of wounds in our study were initially acute, often progressing to chronic wounds due to inadequate or poor management.

In Kenya, a majority proportion of wounds stem from preventable causes, with trauma, burns, and post-surgical wound sepsis being the predominant contributors. We recommend timely and appropriate management of these wounds to alleviate the wound disease burden in the country. It is also essential to address the prevention of trauma and burns within the country while simultaneously enhancing training programs for the management of post-surgical wounds.

Conflicts of interest

The authors declare no conflict of interest.

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