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Diabetes, hand and/or foot ulcers: A cross-sectional hospital-based study in Port Harcourt, Nigeria

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Abstract

Objective: The study aimed to establish the prevalence of diabetes mellitus and the pattern of diabetic hand and foot ulcers in hospitalized adult patients in a teaching hospital in Port Harcourt, Nigeria.

Research Design and Methods: All medical admission at the University of Port Harcourt Teaching Hospital between January 2000 and April 2001 were included in this cross-sectional study. Diabetes mellitus was diagnosed based on a fasting venous plasma glucose ≥7.0 mmol/l or a 2-h post-prandial venous plasma glucose level of ≥11.1 mmol/L using the glucose oxidase method. Data was processed for the 60 diabetic patients with limb ulcers excluding ulcers from major trauma.

Results: The prevalence of diabetes mellitus was 38.1% (95% CI = 34.8–41.4) among medical in-patients; while hand and foot ulcer was 19.1% among diabetic patients. The left lower limb ranked highest in ulcer involvement (32/60); hand ulcers were found in 5 cases (8.3%). Twenty (33.3%) of the patients had a previous limb ulcer. In 31 patients (51.7%) the ulcers evolved spontaneously without an identifiable cause (p-value = 0.00). By Wagner's Grading System, Grade III lesions ranked highest (21/64).

Conclusions: A high prevalence of hand and foot ulcers was confirmed among patients with diabetics, which are common indications for hospitalization, and usually associated with long hospital stay with adverse outcomes including amputation and death. Diabetes education needs to be stepped-up, with emphasis on foot care and early presentation to hospital in the event of limb ulceration.

Keywords: Adult diabetes; Ulcers; Hand and foot ulcers; Hospital study; Nigeria

1. Introduction

The prevalence of diabetes mellitus is reaching epidemic rates globally and the number of adults with diabetes is projected to reach 300 million worldwide by the year 2005 [1]. In Nigeria, the national prevalence of diabetes is 2.2% with a wide regional variation from 7.2% in Lagos metropolis, South–West Zone, to 0.6% in Mangu, a rural community in Plateau State, North Central Zone [2]. A recent community-based study in Port Harcourt, the capital city of the oil and gas industry, South–South of Nigeria, reported a prevalence rate of 6.8% [3].

The main causes of morbidity and mortality in Nigerian diabetics include uncontrolled hyperglycemia, foot ulcers, cardiovascular diseases, cerebrovascular diseases, and nephropathy [4–6]. Various studies in Nigeria have highlighted the burden of diabetes and its

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complications [4–9]. In Port Harcourt, diabetes mellitus is the fifth commonest cause of medical deaths [10], with diabetic foot ulcers and related sepsis being the commonest complications [11]. Severe hand infections often culminating in amputation and even death are well described in people with diabetes in tropical countries. However, there are relatively very few published data on diabetic hand infections in Nigeria. This study is aimed at establishing the hospital medical admission prevalence of diabetes mellitus and the pattern of diabetic hand and/or foot ulcers in hospitalized adult patients in Port Harcourt, Nigeria.

2. Materials and methods

All adults 16 years and above with a diagnosis of diabetes mellitus (both old and new cases) that were admitted into the medical wards of the University Teaching Hospital in Port Harcourt between January 2000 and April 2001 were included in this cross-sectional study. New cases were diagnosed based on the criteria of the World Health Organization [12] of a fasting venous plasma glucose $\geq$7.0 mmol/l or a 2-h post-prandial venous plasma glucose level of $\geq$11.1 mmol/l using the glucose oxidase method [13]. Diabetic patients with hand and/or foot ulcers resulting from major trauma like road traffic accidents were excluded from the study.

Diabetic patients with hand and/or foot ulcers were interviewed using a pre-tested structured questionnaire to document clinical history, including family/social history, and physical examination performed to identify and characterize the ulcers. Outcomes specific for extremity vascularity and neuropathy are reported in a separate paper [14].

Data collected were double-entered into a computer database using EPI-INFO v6.4b and analyzed using the same application.

3. Results

During the period under review, a total of 827 patients were medical admissions in the University of Port Harcourt Teaching Hospital; 315 of which were cases of diabetes mellitus, representing 38.1% (95% CI = 34.8–41.4) of medical admissions. Sixty of those with diabetes had hand and/or foot ulcers. This equates to a prevalence of diabetic hand and/or foot ulcer of 7.3% among medical admissions; and 19.1% amongst patients with diabetes.

The age of the 60 patients with hand and/or foot ulcers ranged from 18–86 years with a mean 54.6 ($\pm$14.7) years, and a peak age group of 40–49 years (31.6%). There were nearly twice as many males (63.3%) as females (36.7%).

The mean duration of diabetes before presentation was 8.6 years, with a range of less than 1 year to 40 years; three of the patients were newly diagnosed at presentation. The modal duration was 6–10 years (28.3%, $n = 17$). Fifty-four patients (90%) had fasting plasma glucose of over 8.0 mmol/l at presentation whilst the mean venous plasma glucose at presentation was 16.01 ($\pm$6.93) mmol/l.

3.1. Mode of presentation of limb lesions

Most of the patients presented with mixed lesions (ulcer, cellulites, abscess and gangrene). However, the presence of ulcer ranked highest at 98.3%; cellulites, 91.7%; abscess, 35%; and gangrene, 33.3%. One patient had dry gangrene with no associated ulcer. Radiological osteomyelitis was documented in six of the patients.

3.2. Lateralization of the limb ulcers

The highest ranked limb of ulcer involvement was the left lower limb (32/64) while the lowest was the left upper limb (2/64)—four persons had ulcers involving more than one limb, thus totaling 64 ulcers in 60 patients. Table 1 shows the pattern of limb involvement in diabetic ulcers. Hand ulcers were found in 5 (8.3%) cases.

3.3. Previous history of limb ulcer/gangrene

Twenty (33.3%) of the patients had had a previous limb ulcer. Of these, nine (15%) had the previous ulcers in the left lower limb, seven (11.7%) reported previous ulcers in the right lower limb, three (5%) had had ulcers in both right and left lower limbs, and the remaining patient had an ulcer in the hand. Previous amputations were reported in seven (11.7%) of them.

3.4. Evolution of current limb ulcers

In 31 patients (51.7%) the current ulcers evolved spontaneously with no definite identifiable cause given

Table 1
Ranking of limb presenting with ulcers among 60 diabetic patients[a]

Affected limb	No.
Left lower	32
Right lower	26
Right upper	4
Left upper	2

[a] One patient had ulcer in both upper limbs, and three had in both lower limbs.