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Hand ulcers/infections and diabetes mellitus in Port Harcourt, Rivers State, Nigeria

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Background

Diabetes mellitus (DM) is a common metabolic disorder in the tropics. Its vascular and neurologic complications are seen mainly in adults, usually involving the lower limbs to cause foot ulcers. Hand ulcer/infection is an uncommon complication, and reports are scanty in Nigeria.

Aim

The study was to ascertain the prevalence, predisposing factors and outcome of hand ulcers among diabetics in our environment.

Materials and methods

A prospective study of diabetic patients admitted into the medical wards of the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Southern Nigeria between January 2001 and April 2002 (16 months) was done. The patients' demographic indices, details of duration of diabetes and history of evolution of hand ulcer as well as evidence of peripheral neuropathy and vascular disease were assessed. Fasting blood glucose estimation was done on admission, and deep wound swabs were obtained for standard microbiological analysis.

Results

Five (1.6%) patients had hand ulcers, with a mean age of 42 years. This gave an incidence of >2 cases/year. There were three females and two males. Minor domestic trauma, application of local herbs to an existing wound, and delayed presentation to the hospital were predisposing factors for the development of hand ulcer/infection. Low socioeconomic class, with poor glycaemic control was also a risk factor. Microorganisms were isolated in all the ulcers, with staphylococcus aureus being the commonest organism. Death occurred in one patient, giving a mortality rate of 20%. The mortality was associated with prolonged hospitalization and amputation of the digit.

Conclusion

Hand ulcer/infection is an increasing cause of morbidity and mortality among adult diabetics in our hospital. It followed trivial trauma in poorly controlled DM, and is worsened by application of local herbs, self-treatment and late presentation to hospital.

Keywords

Diabetes mellitus, Hand ulcers

Introduction

Diabetes mellitus (DM) is the commonest metabolic disorder seen in the tropics[1]. Its vascular and neurologic complications have a predilection to the lower limbs leading to foot ulcers[2]. Hand ulcers/infection complicating DM is relatively rare and has been termed 'Tropical Diabetic Hand (TDH) syndrome[3]. This syndrome has been described in Western world as well as in some tropical countries[2,3,4]. The development of the hand ulcers may or may not be associated with any evidence of neuropathy or arterial insufficiency. Trivial trauma to the hand, poor glycaemic control and applications of herbal remedies to the wounds are usually the predisposing factors[3].



Figure 1. Auto-amputation of the terminal phalanx of the index finger

The available literature of hand ulcer from Nigeria was in the eightees, and is therefore old[2]. We evaluated patients with DM to determine the current prevalence, predisposing factors and outcome of hand ulcers/infection in south -southern part of Nigeria.

Patients and Methods

A prospective study of diabetic patients admitted into the medical wards of UPTH over a 16 months period (January 2001 and April 2002) was done. The patients' demographic indices of age, sex, weight, height and educational status were documented on presentation. Their socio-economic class was determined as described by Abengowe et al[5]. Details of duration of diabetes and history of evolution of hand ulcer were documented at presentation.

Patients were assessed for peripheral neuropathy based on presence or absence of pain, numbness and/or paraesthesia on the limbs. Peripheral vascular disease was also assessed by the presence or absence of the radial and brachial pulses on palpation. Fasting blood glucose estimation was done on admission, and deep wound swabs were obtained from the most active site of the ulcers and sent for standard microbiological analysis.

Results

A total of 315 adults with the diagnosis of DM were admitted during the study period. Out of these 5 (1.6%), 2 males and 3 females had hand ulcers. Their ages and body mass index (BMI) ranged from 18 to 65 years (mean 42 years) and 20.9 - 31.0 kg/m^2 (mean 24.7 kg /m^2) respectively. Three patients were from low social class 1-3.

The duration of ulcer before presentation to the hospital was from 1 to 5 weeks (mean 2.8 weeks). The ulcers were unilateral in four cases (3 right, 1 left), while one had bilateral hand involvement. Three patients were on self-medications with penicillin antibiotics, and 2 patients were on herbal treatment. The mean duration of diabetes before the development of ulcer was 5.8 years (range 1-12 years). The fasting blood glucose was between 8.7mmol/L and 21. 2 mmol/L (mean 16.68 mmol/L).

Minor trauma from broom stick injury (1), fishing hook (1), frying oil (2) and intravenous cannulation (1) were predisposing factors to hand ulcer. Two patients had both symptoms of peripheral neuropathy and absent radial pulsation.



Figure 2. Post surgical disarticulation of the index finger, and hand ulcer following a broomstick injury

Microorganisms were isolated from all the ulcers. Staphylococcus aureus was the commonest organism isolated in 3 patients. Mixed growth of Proteus with Escherichia coli, and Streptococcus with Pseudomonas were isolated in two patients respectively.

All the patients received intravenous antibiotics, antitetanus serum and insulin therapy. Surgical disarticulation of the right index finger with extensive debridement and wound grafting was done in one patient who had auto-amputation of the distal aspect of the second digit (Figs 1 & 2). She subsequently died from septicaemia after prolonged hospitalization (101 days).

One patient refused arm amputation and had self discharged against medical advice (SAMA). The remaining three patients responded to medical and surgical treatment and were discharged home with no residual deficits. The average duration of hospital admission for the patients was 44.25 days (30-101 days).

Discussion

The study noted a prevalence rate of 1.6% of hand ulcer among DM. This is comparable to rate of 4% reported by Akintewe et al[2] in a previous Nigerian study. The occurrence of hand ulcer at the rate of >2cases/year in this study supports the analysis by Gill et al[3] that diabetic hand infection is relatively common in southern Nigeria including Gambia, South Africa and Tanzania. In United States of America, McConnell and Neale[6], and Stern et al[7] noted that DM accounted for 7% and 5% of cases of hand ulcer seen in Ohio and Texas respectively.

The relative dominance of middle age female in this study has been reported by previous African studies[3,4,8]. This is probably because African women are more involved in domestic work including fishing in this coastal area of Nigeria, which exposes them to frequent hand trauma. Also cultural practice, leading women to attend hospital less frequently than men have been noted to contribute to late presentation with severe hand infections in females as noted in the present study[3,8]. Impaired immune reaction as well as increased vascular and neurological complications in prolonged DM may predispose them to severe deep hand ulcer[9]. Two patients in this study had both symptoms of peripheral neuropathy and absent radial pulsation.

What is already known on this topic

Diabetic hand ulcer/infection is a less-recognized complication of DM. The typical picture is that of severe sepsis secondary to trivial trauma to the hand in a poorly controlled diabetic patient. Neglect, hyperglycemia, initial presentation to traditional healers, with delay in hospital attendance allows rapid spread of palmar sepsis. Compromised circulation to the fingers may result in digital gangrene, which may culminate in amputation and even death.

What This study adds

Our study revealed that diabetic hand ulcer/infection is relatively common in the Niger Delta area of Nigeria, with >2cases/year. The identified risk factors were minor domestic trauma, application of herbal remedies to the wound, low socio-economic class, poor glycaemic control and late presentation to the hospital. It is important to note that low socioeconomic status is associated with poverty, inability to provide drugs and also delay presentation to hospital for regular follow up. However, cultural factors encouraging use of local herbs either as substitute for hypoglycemic agents or application on the site of injury cuts across all social class in Nigeria, and often lead to poor glycaemic control and wound sepsis respectively.

In Nigeria, use of traditional medicines including local application of herbs to wounds, self-medication and visits to spiritualist are common due to poverty and ignorance[10]. Three of our patients were of low-socioeconomic class. These factors would lead to patients presenting late to hospital as noted in this study. Poor glycaemic control was also a feature in four of the patients with fasting blood glucose greater than or equal to 16 mmol/L. Although, due to lack of equipment for glycosylated haemoglobin (HbAic) assay in our hospital it was not actually possible to assess patients' glycaemic control over the preceding 3 months.

The mean age of patients (42 years) with hand ulcer in this study compares favorably with 43 years reported earlier by Akintewe et al[2] . Hand ulcer is not a reported complication of DM in children because of early demise of these patients who are invariably Type 1[11] .

Previous studies have reported staphylococcus aureus as the commonest organism isolated in DM hand ulcer, as found in this study[2,12]. This is probably because staphylococcus aureus is a common skin flora and could easily infect skin ulcers. We were unable to isolate anaerobes due to lack of facilities for gas-liquid chromatography for anaerobic isolation in our hospital.

All the patients had prolonged hospitalization due to both surgical and medical treatment, with loss of money and family disruption. One patient died in the hospital in spite of having required amputation of the finger.

In conclusion, hand ulcer/ infection is an increasing cause of morbidity and mortality among adult diabetics in our hospital. It followed trivial trauma in poorly controlled DM, and is worsened by application of local herbs, self-treatment and late presentations to hospital.

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