Diabetic Foot: a preliminary study

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Abstract
Diabetic foot ulcer causes serious disability and considerable strain over the scarce resources of the patients in our community and country. The objectives of the study were to identify the risk factors of diabetic foot in patients admitted in the surgical ward at the Western Regional Hospital, Belize; to monitor the management of diabetic foot ulcer in said hospital and the outcome of those patients. Material and Methods Twelve patients admitted to the surgical ward with diabetic foot problems were interviewed, examined and studied. Patients were examined for peripheral pulses, sensations and body mass index determined. All patients admitted to the surgical ward of the Western Regional Hospital for diabetic foot ulcer receive treatment with metronidazole and a third generation cephalosporin. More than half of the patients get discharged after debridement. During their hospital stay, treatment and outcome were observed and recorded. Results Of the 12 patients studied, 5 (41.7%) were women and 7 (58.3%), men. Half of the patients (50%) were over 60 years. Ten (83.3%) of them had type 2 diabetes and 2 (16.7%) were type 1 diabetics. Awareness about risk factors causing diabetic foot problems was lacking among all patients. Glycaemic control was poor in six patients (50%); fair in 5 (41.7%) and good in only one (8.3%). Most patients were overweight (58.3%). More than half of the patients, 66.7%, never received education about foot care for diabetics. Nine patients (75%) were on oral hypoglycaemic agents; two (16.7%) were treated with insulin, while one (8.3%) was not receiving treatment. Duration of diabetes was greater than 10 years in 9 of the patients. Six patients were more than sixty years-old. The main cause for diabetic foot ulcer was blisters and burns in 50.0% of the patients. In two patients, the cause was unknown and in two patients each, they were trauma and ingrown toe nails. All patients received more than one antibiotic. In two patients (16.7%), foot ulcers healed only by conservative management; seven patients (58.3%) were subjected to debridement and desloughing; and one each to toe amputation, trans-metatarsal amputation or below knee amputation. Conclusions Lack of education, poor glycaemic control, duration of diabetes mellitus for more than 10 years and male sex were the main risk factors for diabetic ulcers. This study also confirmed that microvascular complications should be screened for in patients with diabetic foot ulcers. Foot care education would be a most important way of dealing with this major problem. Non-compliance to treatment is the major risk factor for amputation.

Key words
Diabetic foot ulcer, diabetes mellitus, antibiotic treatment, debridement, amputation

INTRODUCTION
Diabetic foot ulcer (DFU) causes serious disability and considerable strain over the scarce resources of the patients in our community and country. The amount of money spent on DFU is not known due to lack of studies. However, an admission for diabetic foot averages eight days of hospitalization at Western Regional Hospital (WRH).

The percentage of diabetic patients affected with DFU in Belize is unknown. However, in the United States foot ulceration affects around 15% of diabetics with the risk of amputation being 15–40 times higher than in non-diabetics. In USA alone it accounts for 30,000 lower extremity amputations each year, around 20% of all hospital admissions of diabetics and costs more than 200 million dollars per year.

MATERIALS AND METHODS
A preliminary observational study was carried out at the Western Regional hospital (WRH), Belmopan, Belize. Twelve patients admitted at the hospital were studied. The history of each patient was recorded in detail on a survey sheet that included: sex, age, body mass index (BMI), duration of diabetes, type, cause of the ulcer, treatment and outcome. Pedal pulses were assessed for patency of circulation and graded as: a) strong, b) weak, c) absent. Vibration sense was checked for neuropathies by using a 256Hz tuning fork, touch sensation was assessed by a monofilament pressed perpendicularly to the feet against several sites including plantar aspects of the first toe, the first, third and fifth metatarsal heads the plantar surface of the heel and dorsum of the feet. The filament was not applied to any callus sites and the response of the patients in both methods was categorized as: a) no feeling (absent) vague feeling (diminished), c) proper (normal). BMI was calculated and categorized into four grades: underweight <19; normal, between 19–25; overweight, between 25–30; and obese >30. Glycaemic control was measured by fasting blood sugar (FBS) recorded in the charts by the ward nurses. FBS up to 120mg/dL was...
considered good, fair (between 121–40mg/dL), and poor (above 140mg/dL). Use of antibiotics and other treatments was recorded and outcome was assessed on the basis of how patients were discharged.

■ RESULTS

Of the 12 patients studied, 7 (58.3%) were male and 5 (41.7%), female. Age distribution showed that 2 (16.7%) were less than 40 years old, 4 (33.3%) were between 40 and 60 years of age and six (50%) were over 60 years old (Figures 1 and 2). Most patients were overweight: two patients were obese and five were overweight for 58.3% of the patients; only three had normal weight and two were underweight (Figure 3). As can be observed in Figure 4, only two (16.7%) patients had type 1 diabetes mellitus (DM). Nine patients had diabetes for more than ten years (since diagnosis) (Figure 5).

Most patients (9 or 75%) used oral hypoglycaemic drugs; two
The main cause for DFU was blisters and burns in half of the patients (50%). In two patients (16.7%), the cause of ulceration was unknown and, in two patients each, they were trauma and ingrown toe nails. The cause of the diabetic foot ulcer was unknown to two (16.7%) of the patients; in 50% it was blisters/boils; in 17%, trauma and in 17%, an ingrown toe nail (Figure 8). On physical examination, sensation was intact in 16.7% of the patients and diminished in 83.3%. Pedal pulse was weak in all patients.

Double intravenous antibiotic therapy with metronidazole and a third generation cephalosporin was administered to all patients. Eight patients (66.7%) were given ceftriaxone and four (33.3%), ceftazidime.

No surgical procedure was necessary in two patients (16.7%), in 7 (58.4%) debridement/desloughing was performed; and one patient each (8.3%), had toe, trans-metatarsal or below knee amputation (BKA). No patient in the study required above knee amputation (AKA).

The only BKA performed was in a patient who did not adhere to treatment. At KHMH, according to a study carried out in 2014,(3) amputations for DFU were performed in 89% of the patients, which is significantly high in comparison with 25% at WRH.

Although our study reflects preliminary findings about DFU patients, their treatments and outcomes at WRH,
submersion, when water reaches the vocal cords and

 lease. “Dry drowning typically happens minutes after

 them are very different,” she said in a school news re-

 lease. “Dry drowning and secondary drowning, explained Dr.

 The big keys to identifying secondary drowning are

 looking for respiratory troubles,” Lanerie said. “If your

 child is vomiting, has difficulty breathing and is sleep-

 ing or is struggling to stay awake, then seek emerg-

 ency care. On the other hand, it’s common for chil-

 dren to get sick, so if it’s just a cough, then you may

 just need to call your health care provider to schedule

 an appointment.”

 A child who had a near-drowning experience should

 be taken to an emergency department and monitored

 to ensure there is no lung damage, Lanerie said.

 Source: Texas A&M College of Medicine, news re-

 lease, July 21, 2017