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Research Article

RISK OF FOOT ULCERS IN TYPE II DIABETIC PATIENTS**Dr. Tahzeeb Mazhar¹, Dr. Ayemon Fatima¹, Dr. Afeera Ahmad¹**¹Ex-House Officer Nishtar Hospital, Multan**Article Received:** August 2020**Accepted:** September 2020**Published:** October 2020**Abstract:**

Diabetic foot complications are the most common cause of non-traumatic lower extremity amputations in the industrialized world. The basic aim of the study is to examine the risk factors for foot ulcers in patients with diabetes mellitus in local population of Pakistan. This cross sectional study was conducted at Nishtar Hospital, Multan during Jan 2019 to December 2019. In this descriptive analytical study all patients with diabetes under 65 years referred to the hospital were studied. Exclusion criteria of the study were hypothyroidism, pernicious anemia, discopathy, malignancy because they can also lead to neuropathy. Forty patients with foot ulcers were treated at the hospital during this period. Forty controls attending the same diabetic clinic during the same period were also selected for the analysis. The mean age of the total sample was 55.5 years. The majority of the sample was male (51.1%), non-smokers (95.6%) and did not have hypertension (67.8%). It is concluded that it is difficult to treat the foot ulcer in diabetic patients. It can be difficult to differentiate local soft tissue infection and inflammation from osteomyelitis. Three-phase bone scans and radiolabelled leukocyte scans are expensive but can help to establish an accurate diagnosis in problematic cases.

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INTRODUCTION:

Diabetic foot complications are the most common cause of non-traumatic lower extremity amputations in the industrialized world. The risk of lower extremity amputation is 15 to 46 times higher in diabetics than in persons who do not have diabetes mellitus. Furthermore, foot complications are the most frequent reason for hospitalization in patients with diabetes, accounting for up to 25 percent of all diabetic admissions in the United States and Great Britain¹.

The vast majority of diabetic foot complications resulting in amputation begin with the formation of skin ulcers. Early detection and appropriate treatment of these ulcers may prevent up to 85 percent of amputations. Indeed, one of the disease prevention objectives outlined in the "Healthy People 2000" project of the U.S. Department of Health and Human Services is a 40 percent reduction in the amputation rate for diabetic patients. Family physicians have an integral role in ensuring that patients with diabetes receive early and optimal care for skin ulcers².

Diabetes mellitus, a metabolic disease, has a population prevalence of about 10-15%. The incidence of foot ulcers range from 8 to 17% in the cohort studies, with varying lengths of follow-up, and cause severe disability and possible hospitalization to patients and considerable economic burden to families³. A variety of foot lesions are seen in people with uncontrolled diabetes mellitus namely fissures, abscess, cellulites, ulcers, claw toes and Charcot's joints. There is a risk of developing gangrene and of consequent amputation of the foot especially for people from the lower socioeconomic strata and for those living in rural areas. Clinical guidelines recommend that all patients with diabetes should be screened annually to establish their risk of foot ulceration⁴. Diagnostic tests and physical signs that detect peripheral neuropathy, and those that detect excessive plantar pressure were all significantly associated with future diabetic foot ulceration. However, there was a paucity of evidence from India concerning the predictive value of symptoms and signs⁵.

Diabetes is one of the main problems in health systems in the world. The world prevalence of diabetes among adults was 6.4%, and will increase to 7.7% by 2030. Patients with diabetes are at greater risk of complications, the most important of them are diabetic neuropathy³ and peripheral vascular disorders that lead to diabetic foot ulcers. Currently the most common cause of neuropathy in western countries is diabetes. Diabetic neuropathy will develop in 50% of

type 1 and 2 patients with diabetes⁶. Diabetic foot problems are the most common cause of hospitalization in patients with diabetes and it accounts for 2 million patients with diabetes in the United States annually and often need long-term hospital admission. Diabetes is a major factor in half of all lower extremity amputations⁷.

Objectives of the study

The basic aim of the study is to examine the risk factors for foot ulcers in patients with diabetes mellitus in local population of Pakistan.

METHODOLOGY OF THE STUDY:

This cross sectional study was conducted at Nishtar Hospital, Multan during Jan 2019 to December 2019. In this descriptive analytical study all patients with diabetes under 65 years referred to the hospital were studied. Exclusion criteria of the study were hypothyroidism, pernicious anemia, discopathy, malignancy because they can also lead to neuropathy, and lower limb edema and congestive heart failure, because they can interfere with the assessment of neuropathy in examination and duration of diabetes less than 5 years in patients with type I because in this period neuropathy has still not developed.

A questionnaire including age, sex, BMI, diabetes duration, type of treatment, HbA1C, deformity, neuropathy symptoms, vascular symptoms, history of foot ulcer, previous training regarding foot care, smoking, history of retinopathy and nephropathy was completed for all patients. The patients were evaluated for deformity: contractured toe, prominent metatarsal heads and Halux valgus. Questions regarding symptoms of neuropathy and vascular disorder including numbness and tingling of toes and legs, pain and feeling hot or cold sensation in the legs, intermittent claudication, rest pain, thin skin, glossy and bluish skin discoloration and foot ulcer or amputation were asked from the patients.

Ulcer evaluation

Participant's feet were evaluated for callus and ulcer. The neurological examination was performed by 10 grams monofilament, nouro-thesiometer, needle and hammer. Superficial pressure was assessed by 10g monofilament. Patients closed their eyes while being tested.

The data was collected and analyzed using SPSS version 19.

RESULTS:

Forty patients with foot ulcers were treated at the hospital during this period. Forty controls attending the same diabetic clinic during the same period were also selected for the analysis. The mean age of the total sample was 55.5 years. The majority of the sample was male (51.1%), non-smokers (95.6%) and did not have hypertension (67.8%). The average duration after diagnosis of diabetes mellitus was 6.1 (SD 6.3) years.

The majority did not have peripheral neuropathy (81.1%), absent peripheral pulses (90.0%), pre-ulcerous states (90.0%), callous (89.9%), fissures on feet (64.4%), nail pathology (97.1%), foot deformity (93.3%) or disability (94.4%). The majority were on treatment with diet and oral anti-diabetic medication (90.0%).

Table 1: Risk factors for developing foot ulcers in patients with diabetes mellitus

Characteristic	Cases n(%)	Controls n(%)	Univariate statistics		Multivariate statistics	
			Odds ratio (95% CI)	P-value	Adjusted odds ratios (95% CI) ¹	P-value
Gender- Male	22 (48.9)	24 (53.3)	0.84 (0.37-1.91)	0.673	0.83 (0.36-1.90)	0.652
Age- Over 55 years	25 (55.6)	23 (51.1)	1.20 (0.52-2.74)	0.673	1.21 (0.53-2.78)	0.652
Body mass index >25	24 (54.5)	26 (57.8)	0.88 (0.38-2.03)	0.759	1.27 (0.55-2.95)	0.578
Hypertension on treatment with ACEI	10 (22.2)	19 (42.2)	0.39 (0.16-0.98)	0.042	0.29 (0.10-0.80)	0.018
Smoker	2 (4.4)	1 (2.3)	2.00 (0.18-22.89)	0.570	2.47 (0.21-29.76)	0.477
Duration of diabetes in years >3	28 (62.2)	22 (48.9)	1.72 (0.74-3.99)	0.203	1.20 (0.52-2.78)	0.669
Treated with anti-hyperglycemic medication or insulin	33 (82.5)	26 (66.7)	2.36 (0.82-6.76)	0.106	2.39 (0.82-6.92)	0.11
Treated with insulin	8 (17.8)	1 (2.2)	9.51 (1.14-79.60)	0.014	11.05 (1.29-94.54)	0.028

DISCUSSION:

Foot ulcers is a disabling complication and not uncommon among people with diabetes mellitus. The disability and possible progression to the loss (amputation) of digits and limbs make it a serious issue⁷. This study attempted to examine the risk factors for foot ulceration using a case control design. Systematic assessments done routinely in the special clinic and the computerization of the data were the strengths of the study. Assessment of arterial pulses using Doppler and biothesiometer were not practical and cost effective in secondary care clinical practice and hence were not used in this study. However, assessment using Doppler often give a misleading ankle/brachial index (ABI) in patients with diabetes due to arterial calcification. Foot pulses were used in

the clinical assessment, and their absence is usually associated with an ABI of <0.76⁸.

The risk factors identified included the need for insulin therapy for uncontrolled blood sugars possibly reflecting a severe form of the condition with poorer glycemic control⁹. The presence of peripheral neuropathy seems to contribute to the development of ulceration and those with pre-ulceration, callosities and deformity seem to be at increased risk¹⁰.

CONCLUSION:

It is concluded that it is difficult to treat the foot ulcer in diabetic patients. It can be difficult to differentiate local soft tissue infection and inflammation from osteomyelitis. Three-phase bone scans and radiolabelled leukocyte scans are expensive but can

help to establish an accurate diagnosis in problematic cases.

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