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Research Article

**A PROSPECTIVE STUDY ON PREVALENCE OF DIABETIC
FOOT SYNDROME WITH TYPE 2 DIABETES**¹Dr. Naveed Iqbal, ¹Dr. Imran Hussain, ²Dr. Muhammad Suleman Akhtar¹Medical Officer at THQ MNS Hospital, Layyah²Medical Officer at Rural Health Centre, Shershah, Multan**Abstract:**

Introduction: Diabetes mellitus is a major public health problem with rising prevalence worldwide and in the year 2015 around 415 million people were known to have diabetes. This estimate is expected to increase to 642 million of the population by 2040. Further, it is the 6th leading cause of death, attributing to 5 million deaths globally in 2015. **Aims and objectives:** The basic aim of the study is to find the prevalence of diabetic foot syndrome with type 2 diabetes among local population of Pakistan. **Material and methods:** This descriptive study was conducted at Hospitals of Layyah in 2018. In this descriptive analytical study all patients with diabetes type 2 under 70 years referred to the hospital were studied. 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. **Results:** 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 overall prevalence of DFS was 51.8% in our population. According to IGWDF Risk Classification, Out of the study population, 48.2% were normal (category 0) while the remaining 51.8% had foot at risk. About 51.8% subjects had foot at risk, 31.3% had foot at risk category 1; 11.9% patients had foot at risk category 2, in which 10.8% PAD and 10.4% patients had deformity. **Conclusion:** It is concluded from our results that the screening for foot complications should start at the time of diagnosis of diabetes and integrated with sustainable patient education at primary care level by training of health care providers at primary care level.

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INTRODUCTION:

Diabetes mellitus is a major public health problem with rising prevalence worldwide and in the year 2015 around 415 million people were known to have diabetes. This estimate is expected to increase to 642 million of the population by 2040. Further, it is the 6th leading cause of death, attributing to 5 million deaths globally in 2015 [1]. Diabetes mellitus, a world-wide increasing disease, is related to a heterogeneous group of metabolic disorders characterized by hyperglycemia resulting from either defects in secretion or insulin action or even both. Many of the patients who seek dental care present systemic diseases, including diabetes, which are often unknown and not controlled. For these risk patients, thorough anamneses are recommended in order to recognize their biological conditions and establish the clinical risks during the intervention. Moreover, the most critical the patient's systemic condition, the more important is the effective anxiety and pain control [2].

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 Britain [3].

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 [4]. 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 ulcers [5].

Aims and objectives

The basic aim of the study is to find the prevalence of diabetic foot syndrome with type 2 diabetes among local population of Pakistan.

MATERIAL AND METHODS:

This descriptive study was conducted at Hospitals of Layyah in 2018. In this descriptive analytical study all patients with diabetes type 2 under 70 years referred to the hospital were studied.

Exclusion criteria

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.

Collection of data

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: contracted 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.

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

Statistical analysis

The data of respiratory function were compared between the smoker and non-smoker groups using the independent t-test for normally distributed data or the Mann-Whitney U test for other distributions. Differences were considered statistically significant at $p < 0.05$.

RESULTS:

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 overall prevalence of DFS was 51.8% in our population. According to IGWDF Risk Classification, Out of the study population, 48.2% were normal (category 0) while the remaining 51.8% had foot at risk. About 51.8% subjects had foot at risk, 31.3% had foot at risk category 1; 11.9% patients had foot at risk category 2, in which 10.8% PAD and 10.4% patients had deformity. Only 8.5% of them belonged to

category 3, in which 9 had an amputation.

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

Table 02: Prevalence of diabetic foot syndrome

Risk category	Characteristics	N	%
Category 0	No peripheral neuropathy	29	48.2
Category 1	Peripheral neuropathy	19	31.4
Category 2	Peripheral neuropathy with peripheral artery disease and/or a foot deformity	74	11.9
Category 3	Peripheral neuropathy and a history of foot ulcer or lower-extremity amputation	13	8.5

DISCUSSION:

Diabetic foot syndrome is defined as a group of syndromes in which neuropathy, ischemia and infection lead to tissue breakdown, and possible amputation. It is essential to identify the “foot at risk”, through careful inspection and physical examination of the foot followed by neuropathy and vascular tests. 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 issue [6]. 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 [7]. However, assessments 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 <0.76 [8].

Prevalence of diabetic peripheral neuropathy using MNSI in the study population was 51.8% [9]. Similar results were observed in Indian studies done by George H et al. in Tamil Nadu and Mackson Nongmaithem et al. in Maharashtra, where prevalence was found to be 47%. The present study results were similar to studies done outside India, studies done by Rodica Pop-Busui et al. in USA and Gashaw Jember et al. in Ethiopia showed 51 and 52.2% prevalence respectively [10,11].

CONCLUSION:

It is concluded from our results that the screening for foot complications should start at the time of diagnosis of diabetes and integrated with sustainable patient education at primary care level by training of health care providers at primary care level.

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