

LEVEL OF KNOWLEDGE ABOUT RISK FACTOR OF DIABETIC FOOT IN DIABETIC PATIENTS

Irfanullah¹, Imtiaz Hussain Bangash², Mohammad Majid Paracha³

ABSTRACT

Introduction: Diabetic foot is often quite a dreaded disability with long stretches of hospitalization and impossible mounting expenses with the ever dangling end result of an amputated limb.

Objectives: To determine the risk factors knowledge level about diabetic foot

Material and Methods: This study was conducted at Medical Department at Khyber teaching hospital, Peshawar. This was a cross sectional study which was conducted for the period of six months in which a total of 325 patients were observed by using WHO sample size software taking 30.1% proportion of good knowledge regarding diabetic foot care, confidence level was 95% and 5% margin of error.

Results: In this study mean age was 60 years with SD \pm 1.26. Mean duration of diabetes was 12 years with SD \pm 2.71. Twenty five percent patients had previous history of diabetic foot and 75% patients didn't had previous history of diabetic foot. Fifteen percent patients had good knowledge of diabetic foot, 38% patients had average knowledge of diabetic foot and 47% patients had poor knowledge of diabetic foot.

Conclusion: In conclusion, this study could be considered as a preliminary study of the risk factors of DF in KPK patients, and to be followed in the future by a large scale prospective study, including all the possible risk factors derived from the current study and other studies.

Key words: knowledge level, diabetic foot, risk factors

INTRODUCTION

The burden of diabetes is growing globally as the world wide prevalence of diabetes in the year 1995 was 4%, which increased to 4.35% in 2002 and at present it is 4.62%. By the year 2015 it is estimated to climb up to 4.95% and to 5.4% by the year 2025.¹

In a survey by WHO, it was shown that in 1995 Pakistan was 8th on the list of top ten countries with high prevalence of diabetes and there were 4.3 million people with diabetes mellitus. However it is estimated that in the year 2025, Pakistan will be 4th on the list with 14.5 million people with this disease.²

The diabetic foot, no wonder is one of the most feared complications of diabetes.³

Prevention programs are needed rather than just treating diabetes and its complications.⁴

Lifetime incidence of foot ulcer in diabetes is 25%.⁵ In United States, 60% of all lower limb amputation occurs amongst diabetics⁶.

Amputation and foot ulceration, consequences of diabetic neuropathy. The risk of ulcers or amputations is increased in people with past foot ulcer history, Peripheral neuropathy, Foot deformity, Peripheral vascular disease, Visual impairment⁷

In some trials, foot care knowledge and self reported patient behavior seem to be positively influenced by education in the short term.⁸

The estimated direct cost of management increased from 2700 +/- 250 rupees (21 +/- 2 pounds) for a UT grade 1, stage B ulcer to 37,415 +/- 24,125 rupees (288 +/- 186 pounds) for UT grade 2, stage D and 49,058 +/- 30,144 rupees (378 +/- 232 pounds) for UT grade 3, stage D ulcers, respectively. The mean direct cost of major amputation (transtibial or transfemoral) was 46,182 +/- 30,742 (356 +/- 237 pounds) whilst the cost of a minor amputation was 50,494 +/- 30,488 rupees (389 +/- 235 pounds)⁹

A study done in Nigeria on 352 diabetic patients showed that only 30.1% had good knowledge about the diabetic foot risk factors. Majority (78.4%) of patients with poor practice had poor knowledge of foot care.¹⁰

The rationale of this study is to assess the knowledge level of diabetic patients about the diabetic foot risk factors. If the knowledge is poor to average then it will be needed to take active measures through medical personal (doctors, nurses, diabetic educators) and mass media to help educate people and prevent dreadly complication of diabetic foot.

¹ Deptt of Dermatology Khyber Teaching Hospital Peshawar

² Deptt of Medicine Khyber Teaching Hospital Peshawar

³ Deptt of Dermatology Lady Reading Hospital Peshawar

Address for correspondence:

Irfanullah Afridi

Senior Registrar Skin ward
KTH Peshawar

MATERIAL AND METHODS

Setting: The study was conducted in medical department in collaboration with skin unit at Khyber teaching hospital, Peshawar.

Study design: Cross sectional study

Duration: Duration of study will be six months after the approval of synopsis.

Sample size: The sample size is calculated by using WHO sample size software taking 30.1% proportion¹² of good knowledge regarding diabetic foot care, confidence level was 95% and 5% margin of error, the sample size was 325.

Sample technique: Non-probability consecutive sampling

Sample selection

Inclusion criteria

All patients having diabetes including type 1 and type 2 irrespective of duration of diabetes mellitus.

Both genders (male and female) will be included in this study

Exclusion criteria:

1. All those diabetic patients who have unilateral or bilateral foot amputation
2. All diabetic patients having age ≤ 15 years will be excluded

DATA COLLECTION PROCESS

Approval of ethical committee will be taken before starting the study. All diabetic patients visiting casualty, OPD to Khyber teaching hospital, meeting the inclusion criteria of this study will be enrolled. Written informed consent, demographic data and histories will be taken from the patients. Diabetes will be defined as a patient having HbA1c $\geq 7\%$ at the time of interview.

Patient will be asked questions about risk factors causing diabetic foot in a multiple choice pattern. Multiple choice questions will be translated into patients own language to make it understandable to diabetic patient. Each question will be marked as one score.

DATA ANALYSIS

Data will be analyzed by using SPSS version 17 on computer. Frequency and percentages will be computed for categorical variables like gender, education, previous history of diabetic foot and questions regarding knowledge assessment. Mean \pm Standard Deviation will be computed for numerical variables like age and diabetes duration. Knowledge will be stratified among the age, gender educational status, duration of diabetes and type of diabetes to see effect modifiers.

All the results will be presented in the form of tables and charts.

RESULT

This study was conducted at Medical Department Khyber Teaching Hospital in collaboration of Dermatology units of Khyber hospital and Lady Reading Hospital. A total of 325 patients were observed to determine the knowledge level of diabetic patients about diabetic foot risk factors and the results were analyzed as:

Age distribution among 325 patients was analyzed as 7(2%) patients were in age range 21-30 years, 29(9%) patients were in age range 31-40 years, 78(24%) patients were in age range 41-50 years, 117(36%) patients were in age range 51-60 years and 94(29%) patients were more than 60 years. Mean age was 60 years with SD ± 1.26 .

Gender distribution among 325 patients was analyzed as 179(55%) patients were male and 146(45%) patients were female.

Education level among 325 patients was analyzed as 98(30%) patients were educated while 227(70%) patients were uneducated.

Type of diabetes among 325 patients was analyzed as 49(15%) patients had type I diabetes and 276(85%) patients had type II diabetes.

Knowledge of diabetic foot among 325 patients was analyzed as 49(15%) patients had good knowledge of diabetic foot, 123(38%) patients had average knowledge of diabetic foot while 153(47%) patients had poor knowledge of diabetic foot.

Stratification of knowledge of diabetic foot with age distribution was analyzed as in 49 patients having good knowledge of diabetic foot, 7 patients were in age range 21-30 years, 25 patients were in age range 31-40 years, 17 patients were in age range 41-50 years. In 123 patients having average knowledge of diabetic foot 4 patients were in age range 31-40 years, 30 patients were in age range 41-50 years. 45 patients were in age range 51-60 years and 44 patients were above 60 years. In 153 patients having poor knowledge of diabetic foot, 30 patients were in age range 41-50 years. 72 patients were in age range 51-60 years and 50 patients were above 60 years. (as shown in Table No 1)

Stratification of knowledge of diabetic foot with gender distribution was analyzed as in 49 patients having good knowledge of diabetic foot, 26 patients were male and 23 patients were female. In 123 patients having average knowledge of diabetic foot, 69 patients were male and 54 patients were female. In 153 patients having poor knowledge of diabetic foot, 84 patients were male and 69 patients were female. (as shown in Table No 2)

Stratification of knowledge of diabetic foot with ed-

Table No 1. Stratification of Knowledge Level of Diabetic Foot with Age Group

Knowledge level/age	21-30 years	31-40 years	41-50 years	51-60 years	> 60 years	Total
Good	7	25	17			49
Average		4	30	45	44	123
Poor			31	72	50	153
Total	7	29	78	117	94	325

Table No 2. Stratification of Knowledge Level of Diabetic Foot with Gender Group

Knowledge level/ Gender	Male	Female	Total
Good	26	23	49
Average	69	54	123
Poor	84	69	153
Total	179	146	325

Table No 3. Stratification of Knowledge Level of Diabetic Foot with Education Level

Knowledge level/ education level	Educated	Non Educated	Total
Good	49		49
Average	49	74	123
Poor		153	153
Total	98	227	325

Table No 4. Stratification Of Knowledge Level Of Diabetic Foot With Types Of Diabetes

Knowledge level/ education level	Type I	Type II	Total
Good	25	24	49
Average	24	99	123
Poor		153	153
Total	49	276	325

Education level was analyzed as in 49 patients having good knowledge of diabetic foot, 49 patients were educated. In 123 patients having average knowledge of diabetic foot, 49 patients were educated and 74 patients were uneducated. In 153 patients having poor knowledge of diabetic foot all the 153 patients were uneducated. (as shown in Table No 3)

Stratification of knowledge of diabetic foot with type of diabetes was analyzed as in 49 patients having good knowledge of diabetic foot, 25 patients had type I diabetes and 24 patients had type II diabetes. In 123 patients having average knowledge of diabetic foot, 24 patients had type I diabetes and 99 patients had type

II diabetes. In 153 patients having poor knowledge of diabetic foot all the 153 patients had type II diabetes. (as shown in Table No 4)

Stratification of knowledge of diabetic foot duration of diabetes was analyzed as in 49 patients having good knowledge of diabetic foot, 30 patients had diabetes from 5-10 years, 19 patients had diabetes from 11-20 years. In 123 patients having average knowledge of diabetic foot, 64 patients had diabetes from 5-10 years, 45 patients had diabetes from 11-20 years, 14 patients had diabetes more than 20 years. In 153 patients having poor knowledge of diabetic foot, 81 patients had diabetes from 5-10 years, 50 patients had diabetes from 11-20 years, 22 patients had diabetes more than 20 years (as shown in Table No 5)

DISCUSSION

Diabetic foot is often quite a dreaded disability with long stretches of hospitalization and impossible mounting expenses with the ever dangling end result of an amputated limb.³

In our study age was one of the most common risk factor of diabetic foot as the incidence of diabetic foot was found more in older age 51 and above. The second most common risk factor was the education level as the illiteracy rate in KPK is very high so that reason most of the patient didn't have any knowledge of diabetic foot and even for other disease. Similar results were found in another study done in United Arab Emirates (UAE)¹¹ the main risk factors for complications of diabetic foot were male gender, poor level of education, UAE nationality, long disease duration, type 2 diabetes mellitus, presence of hypertension, and poor glycemic control. Diabetics have a high risk of atherosclerotic peripheral vascular disease, and in combination with PNP, and minor trauma it would be a cause of foot ulceration.¹¹ 11 Of a total of 50 cases of amputations carried out in Makkah, Saudi Arabia, 86% were due to diabetes with PNP, and circulatory disorder.¹² The present study revealed that patients with diabetic foot were around 14 times more likely to have PNP, as compared with patients without diabetic foot after adjusting for age and gender, while peripheral vascular disease was no more associated with diabetic foot. However, peripheral vascular disease was not investigated using non-invasive vascular assessments such as the ankle brachial pressure index that may have permitted refining the data.¹¹

Our study shown that long duration of diabetes is yet another major risk factor of diabetic foot as most of the patient had duration of diabetes more than 15 years. Similar findings were observed in another study done by Crawford et al,¹³ in which the length of the time that a person had diabetes was marginally predictive of diabetic foot in 2 cohort studies, although in 5 methodologically week- case-control studies, the association was not statistically significant.¹³

In the present study, this association was significant and patients with diabetic foot were more than 4 times more likely to live with diabetes for 20 years or more. Moreover, when applying the ROC curves, the duration of 11 years was the optimum cut-off point for the prediction of diabetic foot, with 80% sensitivity, and 72% specificity. It has been reported that, in diabetic foot, investigations for the presence of osteomyelitis are necessary only when the ESR and C-reactive protein (CRP) levels are high.¹⁴ However, studies are inadequate to support this.

In the present study, raised ESR was significantly associated with diabetic foot after the adjustment for age and gender. Patients with diabetic foot were more than 5 times more likely to have an ESR of 60 mm/hr or more. Our study also showed that the value of 54 mm/hr was the optimum cut-off point for the prediction of diabetic foot, with 85% sensitivity, and 70% specificity.¹⁵ However, in our study, neither osteomyelitis, nor infection was investigated. In a previous study,¹⁶ all patients with an ESR >70 mm/hr had osteomyelitis, despite the lack of physical signs of inflammation. In another study,¹⁷ ESR showed a specificity of 100%, and a sensitivity of 28% in the patients with non-inflamed peripheral vascular disease, and the sensitivity decreased to 23% in patients with inflamed diabetic foot. However, a moderate rise in ESR may not necessarily reflect the presence of acute Charcot osteoarthropathy. In the present study, male gender was a significant risk factor of diabetic foot. This was in agreement with many other studies.^{11,18,13} Numerous factors may play a role in the effect of gender on lower extremity morbidity. These factors include smoking behavior, level of activity, strength of social support mechanisms, educational level, hormonal differences, degree of compliance, level of denial, as well as the prevalence, and severity of vascular disease, and neuropathy with diabetes.

This study has some limitations. It was difficult to correlate the clinical findings with the electrophysiological, and morphologic findings of the neuropathy, such as nerve conduction studies, especially that discordance between symptoms and electrophysiological testing was reported in diagnosing diabetic neuropathy.¹⁹ Moreover, peripheral vascular disease was not investigated using non-invasive vascular assessments such as the ankle brachial pressure index, may validate the data.¹¹ Another limitation was that the patients were selected based on attending a specialized

center, where the prevalence of the risk factors such as peripheral vascular disease may be higher than that those among patients in the primary health care setting.²⁰ However, despite the limitations mentioned and the limited resources, this study was able to disclose important information on the problem of diabetic foot in KPK.

CONCLUSION

In conclusion, this study could be considered as a preliminary study of the risk factors of diabetic foot and to be followed in the future by a large scale prospective study, including all the possible risk factors derived from the current study and other studies. It emphasizes the importance of early detection of PN among diabetic patients. The introduction of such a strategy is essential in any program aiming to reduce the burden of diabetic foot complications. Regular screening for foot complications is recommended in all patients in view of the high rates of PN reported in the population.

Treating physicians should be encouraged to exert more attention and care to foot examination, especially for the patients who have lived with diabetes for more than 10 years, as well as those with a high ESR of more than 54 mm/hr.

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