FREQUENCY OF COMMON RISK FACTORS OF DIABETIC FOOT ULCERS (DFU)

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ABSTRACT

Introduction: Diabetes Mellitus (DM) is now one of the most common non-communicable diseases globally. Between 2009 and 2034, the number of people with diagnosed and undiagnosed diabetes will increase from 23.7 million to 44.1 million in US. Complications from diabetes, such as coronary artery and peripheral vascular disease, stroke, diabetic neuropathy, amputations, renal failure, and blindness are resulting in increasing disability, reduced life expectancy and enormous health costs for virtually every society. Foot ulcers are a common complication of diabetes mellitus, and these lesions frequently become infected.

Objective: To determine the frequency of common risk factors leading to diabetic foot ulcers (DFU).

Material and Method: This descriptive cross-sectional study was conducted at Surgical C Ward Hayatabad Medical Complex Peshawar. Sample size was 179 and non-probability consecutive sampling technique was used for sample collection.

Result: Out of 179 patients 114(63.7%) were male and 65(36.3%)were female. Mean age of patients was 51 years with SD ± 1.26. Visual Impairment, PN and PAD was found in 32.4%, 32.4% and 30.2% of patients respectively. Left foot was more commonly affected (63.7%) compared to right foot (36.3%). There was significant association of diabetic foot ulcer with duration of diabetes and duration of diabetic foot ulcer.

Conclusion: Our study concludes that peripheral neuropathy, peripheral arterial disease is recognized risk factors for foot ulceration. These risk factors should be taken into consideration while educating diabetic patient.

Key words: Diabetic foot ulcers (DFU), Diabetic complication, PAD, Diabetic Neuropathy.

INTRODUCTION:

Diabetes mellitus (DM) is one of the leading causes of non-traumatic lower extremity amputations (LEA) worldwide.[1] Diabetic foot ulcers (DFUs) account for prolonged hospital stay with its attendant spiraling of hospital bills. Foot lesions in DM are associated with significant morbidity and mortality[2–6]yet they are one of the most preventable long–term complications of DM. Prevalence rates of DM foot lesions vary from 0.9% to 8.3% in Nigeria[6].

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Early diagnosis and presentation to hospital for prompt treatment of DFU can reduce the significant morbidity and mortality associated with this condition[7,9].Risk factors of DFU includes spontaneous blisters (52.46%), peripheral vascular disease (44.3%), peripheral neuropathy (42.6%), and visual impairment (21.3%). The common ulcer grades were IV (44.3%) and III (36.1%). The amputation rate was 52.2% while the mortality rate was 14.3%.[10] There is shortage of trained diabetes care specialists for the ever-increasing population of diabetic patients in primary and secondary health care centers. Most patients will seek treatment from health care providers with little or no training in managing diabetic foot ulcers. Availability and affordability of facilities for rehabilitation of amputees are scarce in region. Hence there is the need to identify the risk factors for diabetic foot ulcer, factors associated with LEA, and management outcomes of patients with DFUs to put preventive measures in place that will reduce burden of DFU and the incidence.

The aim of this study was to determine the prevalence of foot ulcer in diabetics and its association with age, gender, BMI, duration of diabetes, peripheral neuropathy, peripheral arterial disease and control of blood sugar level.

MATERIAL AND METHODS:

This descriptive cross sectional study was carried out at Surgical C Ward Hayatabad Medical Complex Peshawar, from January to December 2021. Total 179 patients were included in the study. All patients who will present to the surgical wards or surgical outpatient clinic with diagnosis of diabetic foot ulcer, patients having diabetes more than 6 month's duration with diabetic foot ulcer, both genders (male and female) were included in this study and Age ranged 30-60 years were included. All those diabetic patients who have unilateral or bilateral foot amputation, immune compromise patients, those who are on steroids for other conditions and pregnant patient were excluded from the study

Statistical analysis was done using SPSS version 23.0. P-value ≤ 0.05 were considered statistically significant.

RESULTS

Among 179patients 114(63.7%) were male and 65(36.3%) were female with mean age of 51 years ± 1.26 SD. Age was grouped in 30-40 Years48(26.8%), 41-50 Years 41(22.9%), 51-60 Years54(30.2%) while in 61-7036(20.1%).Visual Impairment was found in 58(32.4%), Peripheral Neuropathy was in 54(30.2%) and Diabetic Ketoacidosis was in 67(37.4%). Duration of DM Equal to or less than 6 Months was 84(46.9%) and more than 6 Months was 95(53.1%). Duration of DFU equal to or less than 3 months was 63(35.2%) and more than 3 Months was 116 (64.8%).Regarding types of diabetes, Type I was 95(53.1%) and Type II was 84(46.9%). Regarding side of foot, Right foot was affected in 65(36.3%) while Left foot was in 114(63.7%) patients. Ischemic ulcer was present in 64(35.8%) while non ischemic ulcer was in 115(64.2%).93(52.0%) of the patients has family history of DM.

Regarding outcome, Lower Extremity Amputation was in 59(33.0%) of patients.

TABLE NO 1. STRATIFICATION OF RISK FACTORS WITH AGE

Age of the participants	Risk Factors			Total	P. Value
	Visual Impairment	Peripheral Neuropathy	Diabetic Ketoacidosis		
30-40 Years	48	0	0	48	0.001
	100.0%	.0%	.0%	100.0%	
	82.8%	.0%	.0%	26.8%	
41-50 Years	0	41	0	41	
	.0%	100.0%	.0%	100.0%	
51-60 Years	.0%	75.9%	.0%	22.9%	
	0	0	54	54	
	.0%	.0%	100.0%	100.0%	
61 -70 Years	.0%	.0%	80.6%	30.2%	
	10	13	13	36	
	27.8%	36.1%	36.1%	100.0%	

	17.2%	24.1%	19.4%	20.1%	

TABLE NO, 2 STRATIFICATION OF RISK FACTORS WITHDURATION OF DM

Duration of DM	Risk Factors			Total	P. Value
	Visual Impairment	Peripheral Neuropathy	Diabetic Ketoacidosis		
Equal to 6 Months	50	19	15	84	0.001
	59.5%	22.6%	17.9%	100.0%	
	86.2%	35.2%	22.4%	46.9%	
More than 6 Months	8	35	52	95	
	8.4%	36.8%	54.7%	100.0%	
	13.8%	64.8%	77.6%	53.1%	
Total	58	54	67	179	
	32.4%	30.2%	37.4%	100.0%	
	100.0%	100.0%	100.0%	100.0%	

TABLE NO. 3 STRATIFICATION OF RISK FACTORS WITHDURATION OF DFU

Duration of DFU	Risk Factors			Total	P.Value
	Visual Impairment	Peripheral Neuropathy	Diabetic Ketoacidosis		
Equal to or less than 3 Months	29	19	15	63	≤0.001
	46.0%	30.2%	23.8%	100.0 %	
	50.0%	35.2%	22.4%	35.2%	
More than 3 Months	29	35	52	116	
	25.0%	30.2%	44.8%	100.0 %	
	50.0%	64.8%	77.6%	64.8%	
Total	58	54	67	179	
	32.4%	30.2%	37.4%	100.0 %	
	100.0%	100.0%	100.0%	100.0 %	

TABLE NO 4. STRATIFICATION OF RISK FACTORS WITH TYPE OF ULCER, TYPES OF DIABETES AND FAMILY HISTORY OF DIABETES

Type of ulcer	Risk Factors			Total	P. Value
	Visual Impairment	Peripheral Neuropathy	Diabetic Ketoacidosis		

Ischemic ulcers	30(46.9%)	19(29.7%)	15(23.4%)	64(100%)	0.001
Non-Ischemic ulcers	28(24.3%)	35(30.4%)	52(45.2%)	115(100%)	
Types of Diabetes Type 1	50(52.6%)	30(31.6%)	15(15.8%)	95(100%)	0.001
Type 2	8(9.5%)	24(28.6%)	52(61.9%)	84(100%)	
Family history of diabetes mellitus YES	50(53.8%)	28(30.1%)	15(16.1%)	93(100%)	0.001
NO	8(9.3%)	26(30.2%)	52(60.5%)	86(100%)	

DISCUSSION

Diabetes mellitus usually causes foot ulcers, and these sores are prone to infection. 3 Lower limb amputations are frequently necessary for patients with DM (15–27%), and infection is the predominant reason in more than 50% of cases4. Cellulitis, abscess, necrotizing fasciitis, septic arthritis, tendonitis, and osteomyelitis are examples of diabetic foot infections. In acute skin and soft tissue infections, Staphylococcus aureus and beta-hemolytic streptococci are the main pathogens.[5]

According to our survey, 14% of patients were between the ages of 31 and 40, 38% were between the ages of 41 and 50, and 48% were between the ages of 51 and 60. With an SD of 1.26, the mean age was 51 years. Male patients made up 55% of the patient population while female patients made up 45%. Similar findings were made in a different study by Hinchliffe RJ et al.11 in which 12 percent of patients were in the age range of 31 to 40 years, 40 percent were in the age range of 41 to 50 years, and 48 percent were in the age range of 51 to 60 years. Male patients made up 60% of the patient population, while female patients made up 40%.

Our study shows that 30.2% patients had Peripheral neuropathy, 32.4 % patients had peripheral artery disease. While in study conducted by Hinchliffe RJ et al[11]50% patients had peripheral neuropathy and 46% patients had peripheral artery disease.

We found sensory loss in 30.2% of our patients compared to a study which reported 20–40%[12], while Abbott CA et al[13] found it in 44% of their patients. Duration of diabetes also had a direct effect on the outcome of the disease. Patients with longer duration of diabetes had more prevalence ofneuropathy and angiopathy and were more prone todevelopment of foot ulcer. Researchers[14] have reported that up to 28%diabetic foot end up with amputation; 20.9% of ourpatients had to be treated with amputation. Peripheral arterial disease was a frequent riskfactor for foot ulcer in Germany (48%), in India and Tanzania it was 12% and 13% respectively.[15]

Duration of Diabetes also increases the risk of developing diabetic foot ulcer. In our study 53.1% patients having DFU had diabetes for more than 6months duration while other study showed 75% had DFU [18], the gross decrease in our study is probably due to good diabetic control.

In our study 33 percent patients end up having amputation. The reported values in other study were 20.9% [17].

CONCLUSION

Our study concludes that peripheral neuropathy, peripheral arterial diseases are recognized risk factors for foot ulceration. These risk factors should be taken into consideration while educating diabetic.

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