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Original Research

Evaluation of risk factors for patients suffering from diabetic foot ulcer

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ABSTRACT:

Background: Diabetes is one of the main problems in health systems in the world. The present study was conducted to assess risk factors for diabetic foot ulcer. **Materials & Methods:** 120 type II diabetes mellitus patients of both genders were included. Information such as diabetic status, duration of the disease, regular or irregular treatment (diet/oral/drugs/insulin), presence of retinopathy, type of lesion etc. was recorded. **Results:** Age group 40-50 years comprised of 10 males and 5 females, 50-60 years had 20 males and 15 females and >60 years had 50 males and 20 females. Out of 120 patients, 60 had DFU. Lesion was abscess in 12, gangrene in 34, cellulitis in 10 and ulcer in 4 cases. Duration of diabetes <5 years had 14, 5-10 years had 16, >10 years had 30 cases. Retinopathy was present in 35, treatment was regular in 20 and irregular in 40, type of treatment was diet in 25, oral drugs in15 and insulin in 20 cases. The difference was significant (P< 0.05). **Conclusion:** Common risk factors for diabetic foot ulcer was advanced age, presence of retinopathy, irregular treatment, duration of diabetes >10 years and on diet only.

Key words: Diabetic foot ulcer, Diet, Retinopathy

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INTRODUCTION

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.[1] Patients with diabetes are at greater risk of complications, the most important of them are diabetic neuropathy and peripheral vascular disorders that lead to diabetic foot ulcers. Currently the most common cause of neuropathy in western countries is diabetes. Diabetic neuropathy (PN) will develop in 50% of type 1 and 2 patients with diabetes.[2] Patients with peripheral vascular disease (PVD) and peripheral neuropathy (PN) lack the conventional symptoms, but are still considered to be at high risk for occurrence of foot complications. PN and PVD are the main causes of non-traumatic lower limb amputation. The risk of ulceration and amputation among diabetic patients increases by two to four folds with the progression of age.[3]

Risk factors for foot ulcer include male gender, duration of diabetes more than 10 years, peripheral neuropathy, foot deformity, peripheral vascular disease, smoking, history of prior ulcers or amputation, poor glycemic control, genetic and nutritional factors, diabetic retinopathy and nephropathy.[4] Among them the main factor is peripheral neuropathy. The best approach in dealing with diabetic foot is prevention of ulcer through the identification of individuals at risk, patient education and follow-up. A person with DM is estimated to have a risk of about 25% of developing the diabetic foot ulcer (DFU) condition during his/her lifetime.[5] The present study was conducted to assess risk factors for diabetic foot ulcer.

MATERIALS & METHODS

The present study was conducted among 120 type II diabetes mellitus patients of both genders. They were enrolled with their written consent.

Demographic profile of each patient was recorded. Information such as diabetic status, duration of the disease, regular or irregular treatment (diet/oral/drugs/insulin), presence of retinopathy, type of lesion etc. was recorded. Assessment of hemoglobin, TLC, DLC, ESR, blood urea, serum creatinine and random blood sugar level was performed. A thorough physical examination was performed. All the cases were managed following conservative and surgical approach. After recording all findings, results were statistically analysed. P value less than 0.05 was considered significant.

RESULTS

Table I Age & gender wise distribution

Age group (years)	Male	Female
40-50	10	5
50-60	20	15
>60	50	20
Total	80	40

Table I shows that age group 40-50 years comprised of 10 males and 5 females, 50-60 years had 20 males and 15 females and >60 years had 50 males and 20 females.

Table II Occurrence of lesions on foot

Lesion	Number	P value
Abscess	12	0.02
Gangrene	34	
Cellulitis	10	
Ulcer	4	

Table II, graph I shows that out of 120 patients, 60 had DFU. Lesion was abscess in 12, gangrene in 34, cellulitis in 10 and ulcer in 4 cases. The difference was significant (P< 0.05).

Graph I Occurrence of lesions on foot

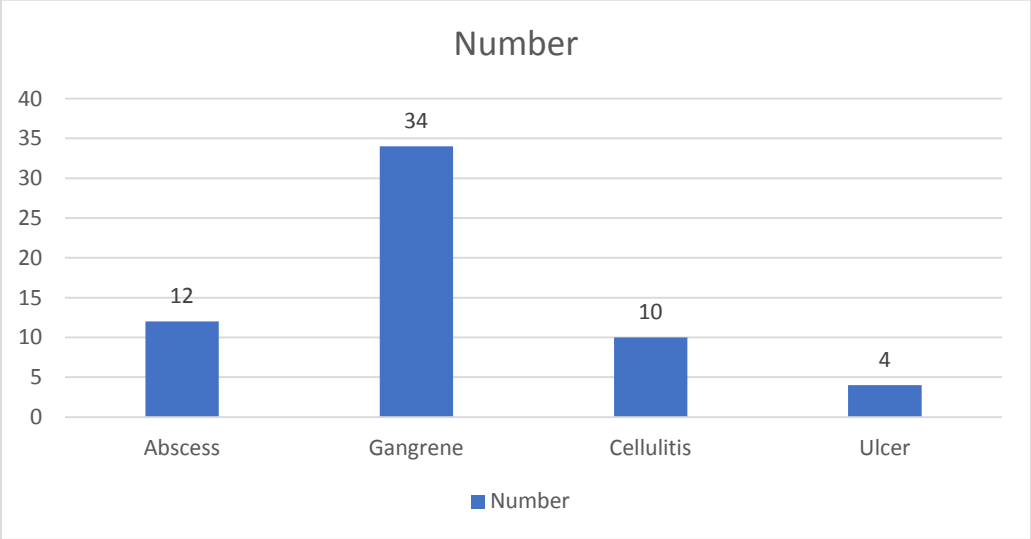
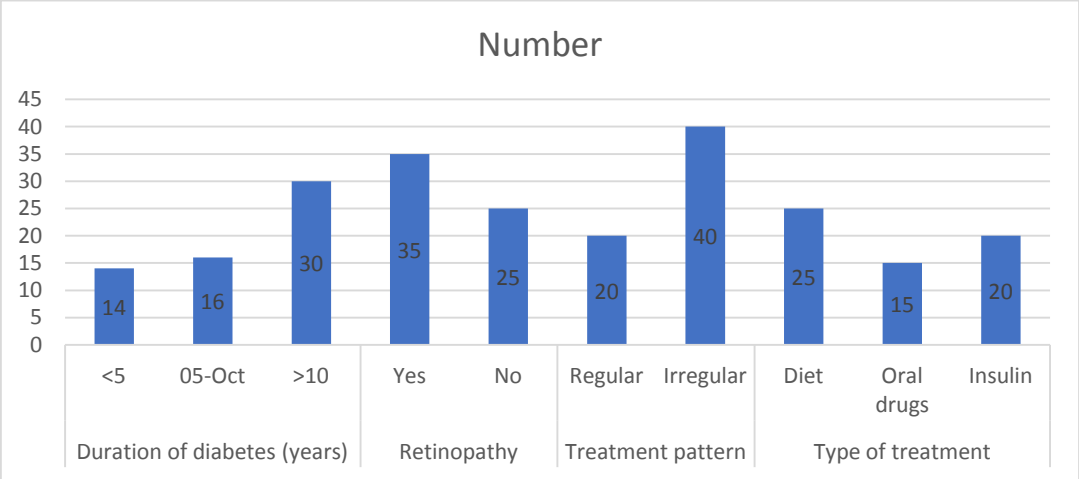


Table III Assessment of risk factors

Parameters	Variables	Number	P value
Duration of diabetes (years)	<5	14	0.05
	5-10	16	
	>10	30	
Retinopathy	Yes	35	0.09
	No	25	
Treatment pattern	Regular	20	0.02
	Irregular	40	
Type of treatment	Diet	25	0.08
	Oral drugs	15	
	Insulin	20	

Table III, graph II shows that duration of diabetes <5 years had 14, 5-10 years had 16, >10 years had 30 cases. Retinopathy was present in 35, treatment was regular in 20 and irregular in 40, type of treatment was diet in 25, oral drugs in15 and insulin in 20 cases. The difference was significant (P< 0.05).

Graph II Assessment of risk factors



DISCUSSION

Patients with diabetes are at greater risk of complications, the most important of them are diabetic neuropathy and peripheral vascular disorders[4] 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 diabetes. 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 amputations.[6]

Diabetic foot ulcers occur in 15% of patients with diabetes in their life time. Risk factors for foot ulcer include male gender, duration of diabetes more than 10 years, peripheral neuropathy, foot deformity, peripheral vascular disease, smoking, history of prior ulcers or amputation, poor glycemic control, genetic and nutritional factors, diabetic retinopathy and nephropathy.[7] Among them the main factor is peripheral neuropathy. The best approach in dealing with diabetic foot is prevention of ulcer through the identification of individuals at risk, patient education and follow-up.[8] It is possible through routine foot exam, including previous history of the patient, the overall look, neurologic assessment (using 10 grams monofilaments and one of these examinations: 128 Hz tuning fork, pin prick, ankle reflexes) and vascular assessment (pulse palpation and measuring Ankle Brachial Index (ABI).[9] The present study was conducted to assess risk factors for diabetic foot ulcer.

In present study, age group 40-50 years comprised of 10 males and 5 females, 50-60 years had 20 males and 15 females and >60 years had 50 males and 20 females. Ravichandran et al[10] in their study a total of 100 subjects were present. The mean age of the subjects was 49.28 + 6.88 years. Out of 100 patients, 23 were females and 77 were males. We observed that 27 patients were undetected at the time of admission at hospital. Majority of patients (n=46) had duration of diabetes from 5-10 years. 19 patients had duration of diabetes less than 4 years, 5 patients had duration of diabetes from 11-15 years. Most of the patients present with more than one lesion. Only major lesion is considered here. Ulcer was the major lesion seen in present series being present in 72 patients.

We found that out of 120 patients, 60 had DFU. Lesion was abscess in 12, gangrene in 34, cellulitis in 10 and ulcer in 4 cases. Shahbazian et al[11] in their study assessed diabetic foot ulcer risk factors according to International Working Group on the Diabetic Foot (IWGDF) consensus. Mean age of patients was 53.8±10.7 years. Two hundred and sixty-nine patients (62/6%) were female and 161(37/4%) were male. Twenty three percent had disturbed sense of vibration, 26% had decreased sensitivity to monofilaments and 17% had decreased pain sensation. Ankle brachial index (ABI) was abnormal in 6%. About 7% had history of prior ulcer. Patients were classified into four risk groups according to IWGDF criteria. Two hundred and seventy- seven patients (65%) were in group 0, 75(17%) in group 1, 47 (11%) in group 2 and 31 (7%) in group 3. Patients in higher–risk groups had higher age, longer diabetes duration, higher HbA1C and less training. The risk was higher in the presence of retinopathy. Patient's sex, BMI, smoking and nephropathy did not have significant correlation with risk of diabetic foot ulcer.

We observed that duration of diabetes <5 years had 14, 5-10 years had 16, >10 years had 30 cases. Retinopathy was present in 35, treatment was regular in 20 and irregular in 40, type of treatment was diet in 25, oral drugs in15 and insulin in 20 cases. Cardaso et al[12] identified the factors for the development of diabetic foot ulceration (DFU) among individuals. The study consisted of 85 individuals. The DFU

condition was prevalent in 10.6% of the participants. Adopting the classification proposed by IWGDF, observed risks for stratification categories 0, 1, 2, and 3 were 28.2%, 29.4%, 23.5%, and 8.2%, respectively. A statistically significant association was observed between the development of DFU and the following variables: time since the diagnosis of diabetes and the appearance of the nails, humidity, and deformations on the feet.

CONCLUSION

Authors found that common risk factors for diabetic foot ulcer was advanced age, presence of retinopathy, irregular treatment, duration of diabetes >10 years and on diet only.

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