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Research Article

**PERIPHERAL VASCULAR DISEASE IN DIABETIC FOOT  
ULCER**

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**Abstract:**

**Objective:** To determine the frequency of peripheral vascular disease in diabetic foot ulcer.

**Patients and Methods:** The cross sectional study of six months was conducted on type 2 diabetic population with foot ulcer > 35 year age and either gender presented at tertiary care hospital. The inclusion criteria were type 2 diabetic patients with diabetic foot infections will explore to have arterial Doppler study. The diabetic foot infection was considered as cellulitis of the foot, infected ulcers, abscess, gangrene/ necrosis of one or more toes or foot. The physical examination included besides routine evaluation, specific attention to presence or absence of peripheral pulses and their character and volume. All patients were subjected to lower limb arterial Doppler after informed consent and findings were tabulated as presence of arterial stenosis or occlusion and level of disease while the frequency / percentages (%) and means  $\pm$ SD computed for study variables.

**Results:** During six months study period total fifty patients of type 2 diabetes mellitus with foot ulcer were explored for peripheral vascular disease. The frequency for male and female population was 35 (70%) and 15 (30%) with mean  $\pm$  SD for age of male and female individuals was 56.75 $\pm$ 6.62 and 58.82 $\pm$ 8.95. The gender distribution male 35 (70%) and female 15 (30%) while regarding the mode of presentation abscess 15 (30%), cellulitis 12 (24%), infected ulcer 09 (18%), toe gangrene 07(14%), forefoot gangrene 07 (14%). The peripheral vascular diseases detected as 28 (56%) while the vessel stenosis were popliteal artery 06 (12%), distal posterior tibial artery 05 (10%), distal anterior tibial artery 04 (8.0%), both tibial arteries distal 05 (10%), both tibial arteries proximal 08 (16%).

**Conclusion:** In present study the prevalence for peripheral vascular disease in type 2 diabetic population with foot ulcer is 56% with male predominance 70%.

**Keywords:** Peripheral vascular disease, Diabetes Mellitus and Foot ulcer

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**INTRODUCTION:**

Diabetes is a common affliction in all parts of the world and incidence is rising in developing countries with high incidence in the developed world. Diabetic foot infections are one of the most common manifestations of the disease necessitating hospital admissions [1]. Majority of lower extremity amputations occur in diabetics, In addition to neuropathy and trophic ulcers, peripheral vascular disease (PVD) plays a vital role in the outcome of diabetic foot infection [2]. The early detection of peripheral vascular disease in seemingly asymptomatic and early cases is useful in correction and improving the blood flow and hence healing and reduction of risk of major limb amputations [3]. Arterial Doppler studies are useful in determining the existence of peripheral arterial occlusive disease, the level of occlusion or stenosis, the extent and the presence of collaterals and along with angiography have superior diagnostic yield [4, 5]. The local literature is limited so there is a strong need to explore peripheral vascular disease in diabetic population with diabetic foot infections. The information could be supportive in formulating protocols for effective management of diabetic patients with the aim of reducing the morbidity & social costs related to diabetes mellitus. Thus the study explored the prevalence of peripheral vascular disease in type 2 diabetic population with diabetic foot infections.

**PATIENTS AND METHODS:**

The cross sectional study of six months was conducted on type 2 diabetic population with foot ulcer > 35

year age and either gender presented at tertiary care hospital. The inclusion criteria were type 2 diabetic patients with diabetic foot infections will explore to have arterial Doppler study while the exclusion criteria were the patients with connective tissue / autoimmune disorders, patients with necrotising fasciitis and severe sepsis and had amputations. The diabetic foot infection was considered as cellulitis of the foot, infected ulcers, abscess, gangrene/ necrosis of one or more toes or foot. The demographical and clinical assessment was done while the emphasis was made on duration of diabetes and infection whereas the physical examination included besides routine evaluation, specific attention to presence or absence of peripheral pulses and their character and volume. All patients were subjected to lower limb arterial Doppler after informed consent and findings were tabulated as presence of arterial stenosis or occlusion and level of disease. The data was collected on proforma while analyzed in SPSS to manipulate the frequencies, percentages and mean  $\pm$ SD of categorical and numerical variables.

**RESULTS:**

During six months study period total fifty patients of type 2 diabetes mellitus with foot ulcer were explored for peripheral vascular disease. The frequency for male and female population was 35 (70%) and 15 (30%) with mean  $\pm$  SD for age of male and female individuals was  $56.75 \pm 6.62$  and  $58.82 \pm 8.95$  whereas the demographical and clinical profile of study population is presented in Table 1.

**TABLE 1: THE DEMOGRAPHICAL AND CLINICAL PROFILE OF STUDY POPULATION**

Parameter	Frequency (N=50)	Percentage (%)
<b>AGE (yrs)</b>		
35-40	06	12
41-49	12	24
50-59	14	28
60-69	11	22
70+	07	14
<b>GENDER</b>		
Male	35	70
Female	15	30
<b>Mode of presentation</b>		
Abscess	15	30
Cellulitis	12	24
Infected ulcer	09	18
Toe gangrene	07	14
Forefoot gangrene	07	14
<b>Peripheral vascular disease</b>		
Yes	28	56
No	22	44
<b>VESSEL STENOSIS</b>		
Popliteal artery	06	12
Distal posterior tibial artery	05	10
Distal anterior tibial artery	04	8.0
Both tibial arteries distal	05	10
Both tibial arteries proximal	08	16

**DISCUSSION:**

The prevalence of PVD was found to be 56% with 28 out of 50 patients showing vascular compromise as diagnosed by arterial Doppler study. Majority of the

individuals in this study were in the age group of 50 - 59 years accounting for 28% of subjects. The prevalence of PVD was found to linearly increase with age and this seems a higher compared to

existing studies it correlates with accepted data that progression with age is significant and indeed accelerated in diabetics [6-8]. This can also be explained by the fact that age related atherosclerotic changes independent of diabetic status worsen with advancing age [9, 10]. The problem of late diagnosis of diabetic status seen in our population could explain the very high prevalence of PVD in advance age groups [11, 12]. The severity of the diabetic foot infection and outcomes were also significantly worse in individuals with PVD. This again correlates with existing data that suggests that the worse outcomes including limb loss is more in individuals with peripheral vascular disease and diabetes as the peripheral ischemia contributing to an already unhealthy local environment for healing [13-15].

On the basis of this study the relevance of investigating the existence of peripheral vascular disease (PVD) and the need to do it on a routine basis even in apparently asymptomatic individuals can be advocated.

#### CONCLUSION:

In present study the prevalence for peripheral vascular disease in type 2 diabetic population with foot ulcer is 56% with male predominance 70%. Thus the detection of peripheral vascular disease in patients presenting with diabetic foot infection using arterial Doppler studies along with routine clinical and laboratory assessment can be of great clinical importance in long term care of diabetic population and proven the need and benefit of investigating diabetics for peripheral ischemia and giving better care to these patients.

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