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Research Article

**UNDIAGNOSED PERIPHERAL ARTERIAL DISEASE
PREVALENCE AMONG PATIENTS OF DIABETES
MELLITUS**Dr M Mosa Ayub¹, Dr Mian Umair Ahmed Arif², Dr Ahmed Ghassan³^{1,3} Jinnah Hospital, Lahore² BHU Dogranwala, Gujranwala**Article Received:** December 2019 **Accepted:** January 2020 **Published:** February 2020**Abstract:**

Introduction: Peripheral Artery Disease (PAD) affects 12 million people in the US. 11.7% in Pakistan. Diabetes (DM) has a significant correlation with PAD. Patients with PAD and DM have a greater risk of amputation than just PAD.

Aim: Our study aimed to measure the prevalence of PAD among diabetics, and to explore quality of management by determining the frequency of ankle-brachial index (ABI) measurement among them. Moreover, it aimed to educate people about PAD and its risk factors.

Place and Duration: In the Medicine Unit II of Services Hospital, Lahore for one-year duration from March 2018 to March 2019.

Methods and materials: A cross-sectional study involving 161 diabetic patients. They were interviewed using a questionnaire about demographics, past medical history and ordinary history. The second part concerned the physical examination of the lower limbs and ABI measurements; values below 0.9 or higher than 1.3 were considered incorrect.

Results: Of the 161 diabetic patients included in the study, 104 (64.6%) were middle-aged 55.3 ± 11.472 and 59.39 ± 12.974 male. 55.9% were hypertensive and 75.8% hypercholesterolemic. 18 (11.2%) smokers were 14 (77.8%) men. 64 (39.8%) cases performed regular exercises, 38 (59.4%) were women. ITB <0.9 was detected in 32 (19.9%). While 24 of them (75%) are middle-aged women 59, 66 are men. Among people with low ITB 7 (23.3%) had symptoms. The most common symptom was numbness and tingling. In addition, 31 (96.9%) patients with PAD had an additional diagnosis other than diabetes. 24 of them (77.4%) are women, and hypercholesterolemia was the most common comorbid disease. Three (9.4%) PAD patients smoked.

Conclusion: In Pakistan, one fifth of DM patients had PAD; the majority is asymptomatic and was females. Large percent of the subjects were not checked by ABI, or the patient was not well informed about PAD, which urge all physicians to consider a periodic check-up for PAD using ABI. Majority of subjects had multiple co morbidities.

Keywords: peripheral artery disease; Diabetes; atherosclerosis; Ankle arm indicator; superiority

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INTRODUCTION:

Peripheral Artery Disease (PAD) affects 12 million people in the United States. Those who have acquired the disease increase the risk of coronary heart disease, stroke or the need for amputation of the affected limb in extreme cases¹. In addition, PAD patients remain asymptomatic for a long time and during diagnosis, and revascularization is difficult and prognosis is poor. Diabetes (DM) changes the function and structure of the arteries, initiates several inflammatory processes and changes part of the coagulation mechanism, leading to changes in the tonicity of the vessels. The incidence of DM in Pakistan is 30%, according to a 2009 survey². DM is one of the strongest PAD risk factors³. Diagnosis of PAD in patients with DM is difficult due to the loss of nociceptors in patients with chronic DM, which explains why many are asymptomatic⁴⁻⁵. In addition, the lack of periodic examinations that doctors should carry out contributes to this. The ankle-brachial index (ABI) serves as a diagnostic tool for PAD. ABI is a very sensitive and specific means for diagnosing PAD, a non-invasive and repetitive procedure. Its normal values range from 0.9 to 1.3, any measurement above or below this range is considered abnormal. When the ABI value is greater than 1.3, it suggests a calcified vessel, but if the ABI value is less than 0.9, it is a diagnosis of obstructive peripheral arterial disease⁶. In a study in Pakistan, 471 people aged 45 years and older studied the incidence and risk factors for peripheral arterial disease, the prevalence of PAD was 11.7%. 92.7% were asymptomatic and mainly suffered from diabetes, hypertension, lipid disorders, smoking, cerebrovascular accident and coronary heart disease⁷⁻⁸. Wuhan in central China studied the occurrence of PAD in patients with type 2 DM, in whom ABI was used as a measurement tool in 2015, and the incidence of PAD in elderly

diabetic patients was 24.1%⁹. Our goal in this study is to estimate the incidence of PAD among DM patients in Pakistan and to reflect the importance of raising awareness among DM patients and to promote early diagnosis of PAD in our region.

METHOD:

This is a cross-sectional study conducted in the Medicine Unit II of Services Hospital, Lahore for one-year duration from March 2018 to March 2019. All patients were over 18 years old and people with type 1 or type 2 diabetes are also included. The informed consent was taken from all patients. The study focused mainly on demographics, ordinary history and the last chapter are mentioned for the exam and ABI findings. ABI was measured using a sphygmomanometer. and duplex ultrasound. All patients have been trained in PAD, and additional explanation was given to abnormal patient's arrangements after the exam. On the other hand, we recommend that these patients inform their physician. Microsoft Office Excel software used for data Introduction and statistics package for the Science version (SPSS) 22. For analysis. Frequency of qualitative data and interest is reported as descriptive statistics. P value A value of <0.05 was considered statistically significant.

RESULT:

Of 161 patients with type 1 and type 2 diabetes registered in our study, 32 (19.9%) had ABI <0.9 and 118 (73.2%) had normal ABI. Eight patients had type 1 and 153 (95.3%) had type 2 diabetes, and 153 (95%) had never been tested with PAD. All participating entities were > 20 years old. The average age of our cases was 55.3 ± 11.472 / 59.39 ± 12.974 for women and men, respectively [Table 1].

Table 1: Characteristics of Population (Diabetic patients) (n=161)

Variable	Percentage
Age (mean/Std. Dev.), yr	56.75 ± 12.144
Females	104 (64.6%)
Males	57 (36.4%)
Comorbidity	
Receiving treatment for hypercholesterolemia	122 (75.8%)
Receiving treatment for hypertension	90 (55.9%)
No co morbidities other than diabetes	25 (15.52%)
Smokers	18 (11.2%)
Regular exercise	64 (39.8%)
No previous ABI measurement	153 (95%)

Symptomatic presentation was relatively rare in patients with ITB <0.9, and tingling was a common presentation. Most participants with ABI <0.9 had comorbid diabetes, hypercholesterolemia was the most common comorbid disease [Table 2].

Table 2: Characteristics of patients with ABI < 0.9 by gender (n=32)

Parameters	Females	Males
No. of Subjects	24 (75%)	8 (25%)
Age (mean), yr	59	66
Symptomatic	5 (15%)	2 (6.25 %)
Comorbidity	24 (75%)	7 (21.9%)
Smoking	1 (3.1%)	2 (6.3%)
Regular exercise	5 (15.6%)	2 (6.3%)
No previous ABI measurement	100%	

In 41 (35%) of 41 patients with abnormal ABI, ABI > 1.4 was found to indicate possible calcification in the peripheral artery. Many publications combine this value with an increased risk of cardiovascular disease. Although calcification is more likely at an older age, older diabetic patients may experience arterial obstruction rather than calcification.

DISCUSSION:

The results of our study indicate a high incidence among patients with diabetes. Therefore, the inclusion of routine ABI measurement for all diabetic patients is necessary to detect early PAD and plan appropriate treatment¹⁰. This recommendation is based on a high relationship and asymptomatic patients with little detection by healthcare providers are encouraging action.

Our results indicate a relatively higher on incidence compared to another similar study in Iran, which showed that the incidence of PAD was 11.7% among 471 patients. In addition, in a study conducted in Kuala Lumpur, Malaysia, the incidence of PAD among 200 diabetic patients was 16%. However, it seems that our incidence is lower in 2010¹¹⁻¹². Compared to the study that estimated the incidence in China at 24.1%. Exercises in our patients have a strong impact the development of PAD in patients with diabetes. Regular exercise programs, such as high-intensity walking 5 times a week, have been shown to have the greatest benefits in terms of PAD symptoms and prognosis. In addition, in our cases, women have a higher incidence of PAD than men¹³. This may be due to low levels of physical activity among women. Smoking is another factor found in various studies that affects the development and progression of PAD. However, in our study, the total number of smokers was only 11.2%, but this result may not be appreciated, as some participants may have concealed socially unacceptable smoking habits¹⁴. In addition, for the same reason, this may be related to the greater number of women in our study, as there is frequent smoking among women in our community. Therefore, smoking did not significantly affect our data¹⁵.

Our study was limited to the small sample size, the limited number of duplex ultrasound available, and the lack of HbA1C data in patients for all year; this can help to provide good reflection on how to control your diabetes and how to follow your medication's recommendations. However, these data

provide a general idea of the occurrence and importance of this disease in our diabetic society.

CONCLUSION:

PAD is a common and serious complication in patients with diabetes and is about 19.9%. Exercise is associated with a lower incidence of PAD in diabetes. Most diabetic patients with ABI abnormalities had other comorbidities. Routine ABI measurement is a simple and effective tool for assessing PAD that is not performed in 95% of diabetic patients who think they have a higher risk of PAD.

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