Frequency of Peripheral Vascular Disease in Type 2 Diabetes

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ABSTRACT

Objectives: To determine the frequency of peripheral vascular disease in diabetic patients.

Study design: Descriptive cross sectional.

Methodology: This study was conducted in department of medicine, Mardan Medical Complex, in which 72 type 2 diabetic patients were included through non probability random sampling technique. A questionnaire was distributed among the participants and ankle-brachial index was measured, and values of ankle brachial index were interpreted as Non compressible Ankle-brachial index more than 1.30, Normal ankle-brachial index 0.91-1.30, Mild to moderate PAD ankle-brachial index 0.41-0.90, Severe PAD ankle-brachial index 0.00-0.40.

Results: In this study 72 diabetic patients were included with sex ratio of male 45 percent and female 54 percent, mean age of the participant was 55.4 with a standard deviation of 10.57. Among the 72 patients 34.2% of the patients were having mild to moderate PVD at right side and 23.6 % of the patients were having mild to moderate PVD at left side.

Conclusion: Using ankle-brachial index we found that the frequency of PAD in diabetic patients are 57.8 % (34.2% of the right side and 23.5% on the left side). This study demonstrated the importance of ankle brachial index in the diagnosis of PAD as compared to other findings like absent pedal pulses and intermittent claudication.

Keywords: Peripheral Vascular Diseases, Ankle brachial index.

INTRODUCTION

The key cause of retarded wound healing, ischemic limb and lower extremity amputation in diabetic patients is peripheral arterial disease. Many clinicians pay little attention to this disorder and it is thus undervalued and underdiagnosed. The PAD in the world has been reported at 4.5% to 29%[1]. The PAD in sub-Saharan African diabetics ranges between 1.7% and 28%[2]. There is a lack of study to determine the prevalence of PAD in our country in Pakistan, in particular in patients who have diabetes.

An estimated 1,1 million people were killed by diabetes mellitus in 2005[3]. According to the World Health Organization (WHO), almost 80% of diabetic deaths occured in low- and medium income countries, and WHO estimates that diabetes deaths will rise by more than 50% without any immediate intervention by 2020. The incidence of diabetes mellitus is shown by an unprecedented increase in developed countries[4]

Epidemiological evidence has shown a clear correlation between type-2 mellitus and PAD[5]. PAD indicates that one or more arteries, typically lower limbs or pelvis, are partially or fully blocked by the atherosclerosis[6].

It may be asymptomatic (mainly sporadic claudication) or in extreme cases these may be symptoms of decreased blood flow during exercise. Peripheral artery disease affects a substantial portion of the world's adult population[7]

It is estimated that in Europe and North America there are up to 28 million people living with PAD. Around 800 000 Canadians suffer from PAD[8], about 4% of those over 40 and 20% over 75 years of age. Within 15 years of diabetes onset, over 50 percent of diabetics have apparent coronary atherosclerotic disorder, with a rise of 22 times that of nondiabetics[9]

The ankle-brachial index detects peripheral arterial disease by means of an objective, accurate, quick and non-invasive measurements of blood pressure in the arms and ankles with a Doppler. The ankle brachial index test is simple and not only one of the most accurate PAD tests but also the least costly and non-expensive one, it is also an outdoor procedure[6]

Doppler is mainly diagnosed with vascular lesions (18% – 28%) in comparison to the poor clinical incidence of peripheral vascular diseases (absence of pulses) (4.4% - 8.2%)[10] This suggests that many people remain undiagnosed, if PAD diagnoses are only clinically evaluated and clarify the importance of the ankle-brachial ABI. In comparison with the angiograms ABI-brachial is 94% responsive and 97% specific to PAD diagnoses[11]. As angiograms are the gold standard for PAD diagnosis but they are intrusive and related to complications such as thrombosis, embolism and allergic reaction to the contrast agent[12].

METHODOLOGY

This descriptive cross sectional study was conducted in the department of Medicine, Mardan Medical Complex Mardan from 1st July 2019 to 31st December 2019. Through non probability random sampling method, Seventy two patients were enrolled. The research included all patients who were aged 23-75 years and diagnosed with diabetes mellitus. After approval by the Ethics and Research Committee, the study was conducted. The research included all patients who had the requirement for inclusion (i.e. diagnosed patients with diabetes mellitus). All patients have been

clarified about the intent and benefits of the study and the related risks. There has been a written informed consent. The study of Doppler, right-hand and left-hand arms, right-hand and left-hand pedis, right and left-hand post-tibial arteries and left- and right-hand ABI values were performed in all patients.

The data were analyzed in SPSS version 23. Frequencies and percentage were calculated for categorical variable like gender and PVD. Mean and standard deviation were calculated for continuous variables like age.

RESULTS

In this study total of 72 diabetic patients were included, male, 45percent and female, 54 percent, mean age of the participant was 55.4 with a standard deviation of 10.57. (Table 1)

Among the 72 patients 34.2% of the patients were having mild to moderate PVD at right side and 23.6 % of the patients were having mild to moderate PVD at left side. (Table 2)

Table 1: Frequency of PAD ankle brachial index right side

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non compressible	5	6.9	6.9	6.9
	Normal	42	58.3	58.3	65.3
	Mild to moderate PAD	25	34.7	34.7	100.0
	Total	72	100.0	100.0	

Table 2: Ankle brachial index left side

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	non compressible	7	9.7	9.7	9.7
	Normal	48	66.7	66.7	76.4
	mild to moderate	17	23.6	23.6	100.0
	Total	72	100.0	100.0	

Table no 3: Gender-wise distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	33	45.8	45.8	45.8
	female	39	54.2	54.2	100.0
	Total	72	100.0	100.0	

DISCUSSION

In this study, we found 57.8% diabetic patients had PAD. Agha Khan, University Teaching Hospital, reported similar results. Looking at the characteristics of type 2 diabetics, they showed end-stage renal failure and found that PAD was 51.7%. (10).

The research conducted on the prevalence of PVD in type 2 diabetes mellitus with A K Agarwal[13] shows that the prevalence of PVD in patients with type II diabetes is 14.4% and women are more vulnerable to PVD.

The PAD frequency of Kamil S et al [14] recorded 8.8% in diabetic patients compared with the non-diabetic 4.9%.

Compared to some studies listed above, the frequency of PAD in our sample is very high. This may be attributed to the fact that most of our patients with diabetes do not know their condition and are therefore complicated and that the development of peripheral arterial disease was possibly unchecked. It must be remembered that tight control hyperglycemia induces a delay and some avoidance of some long-term complications such as atherosclerosis and neuropathy.

In the United Kingdom Prospective Diabetes Study (UKPDS), 1.2% of patients with newly diagnosed type II diabetes

suffered from PVD [16](under ABI definitions) and raised their prevalence up to 12.5% with 18 years of diabetes duration[15].

It was found that about one-third had claudication and the remaining patients had serious type of disease, with about half asymptomatic or atypical symptoms. Physical symptoms in your leg that may suggest peripheral vascular disorder include muscle atrophy, hair loss, smooth skin, lower or absent pulses in your foot, non-healing ulcers or fractures in your limbs, and toes' coldness or numbness [17].

Use of the ankle-brachial index to determine a peripheral arterial disorder indicates that ABI is helpful in this study.

CONCLUSION

The study results indicate high PAD frequency in diabetic patients who were presented in the Mardan Medical Complex. In the identification of peripheral artery disease in particular in asymptomatic diabetic patients, the use of the ankle-brachial index calculated by Doppler is very dependable.

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