

PERIPHERAL ARTERIAL DISEASE (PAD);

Frequency in diabetics.

Dr. Qaiser Mahmood, Dr. Nasreen Siddique, Dr. Affan Qaiser

ABSTRACT... Objectives: (1) To determine the frequency of PAD in diabetic patients. (2) To compare the frequency of PAD in diabetics taking different treatment modalities. **Design:** Observational Cross-sectional study. **Setting:** Diabetic Research Centre Nishtar Hospital Multan. **Period:** Dec. 2010 to Dec.2011. **Material and method:** Four hundred and forty three (443) consecutive diabetic patients were included in the study. History, Clinical Examination, Blood Sampling, HBA1C and Doppler's studies for ABI were carried out. Grading of severity of PAD was done on the basis of ABI. **Results:** A total of 443 diabetic patients were screened for PAD by ABI. Out of 443 diabetic patients 346(78.1%) were males and 97(21.9%) were females. 332(74.9%) patients were in age group 35-45 years, having normal ABI. 111(25.1%) patients were in age group of 45-55 years having abnormal ABI. So on the basis of ABI the frequency of PAD was found 25.1%. Among 111 diabetic patients with abnormal ABI 97(87.4%) have mild to moderate PAD while 14(12.6%) have severe PAD. Patients with severe PAD were in age group 55 and above and they have longer duration of diabetes. Out of 111 diabetic patients with abnormal ABI 87(78.4%) were males and 24(21.6%) were females indicating disease predominance in males. PAD was more common in patients who were on Oral hypoglycemic agents **Conclusions:** The study demonstrates a high prevalence of PAD among people with type 2 diabetes mellitus. This needs to be appropriately evaluated by the medical professionals.

Key words: Peripheral Arterial Disease, Ankle Brachial Index.

Article Citation

Mahmood Q, Siddique N, Qaiser A. Peripheral arterial disease (PAD); frequency in diabetics. Professional Med J 2013;20(4): 513-518.

INTRODUCTION

PAD is a slow progressive atherosclerotic occlusive disorder of arterial system and may involve any blood vessel but legs and feet are most commonly affected, thus the name PAD. It is commonly manifested as intermittent claudication or critical limb ischaemia¹.

It is twice common among diabetics compared with non-diabetics and is strong predictor of subsequent cardiovascular morbidity & mortality in patients with type 2 diabetes².

American Heart Association (AHA) estimates that 8-10 million Americans have PAD, Nearly 70-80% affected individual are asymptomatic, Over a 5 years period 25-35% people with PAD will suffer myocardial infarction (MI) or stroke and an additional 25% will die, usually from cardiovascular cause within 6 months³.

It has been reported that patients with PAD and diabetes experience worse lower-extremity

dysfunction than those with PAD alone⁴, but only minority require revascularization and amputation⁵.

Diabetes mellitus is especially considered as an important risk factor for PAD⁶.

Other risk factors are smoking, advanced age, hypertension, obesity, hyperlipidemia, Male, Post menopausal female, hyperhomocysteinemia and physical inactivity⁷.

The number of diabetics is increasing in Pakistan as a result of urbanization, physical inactivity and obesity. Pakistan is considered to be one of the countries with the largest population of people with diabetes and is ranked seventh globally by the International Diabetes Foundation⁸.

The prevalence of diabetes is high in Pakistan ranging from 7.6% to 11% among adults⁹. The incidence of symptomatic PAD increases with age from about 0.3%

/year for men aged 40-55years to about 01 %/year for men aged over 75years¹⁰.

In USA the prevalence of PAD is 12-20% after the age of 65 years and prevalence of PAD also increases with the duration of DM¹¹.

It is important to diagnose diabetes early and offer treatment to avoid PAD and other vascular complications¹². For early diagnosis the inter digital spaces should also be inspected for fissures, ulcerations, and infections in addition to other investigations¹³.

Ankle Brachial Index (ABI), which is the ratio of ankle to brachial systolic blood pressure, is 95% sensitive and 100% specific, a simple, non-invasive and reliable bedside method for diagnosing the presence and severity of PAD¹⁴.

American College of Cardiology / American Heart Association (ACC/AHA) recommend measurement of ABI in symptomatic patients as a diagnostic criterion¹⁵.

A patient with an ABI of <0.9 was classified as having PAD, as many studies have found that a ratio of ≤ 0.90 signifies the presence of PAD¹⁶. The recently published U.K prospective Diabetes study has shown that intensive glucose control reduces effectively microvascular complications in patients with type 2 Diabetes¹⁷.

PURPOSE OF STUDY

The purpose of study was intended to determine the frequency of PAD in diabetic patients. Diabetes mellitus is especially considered as an important risk factor for PAD and the number of diabetics is increasing in Pakistan as a result of urbanization, physical inactivity and obesity. Ankle Brachial Index (ABI), is a simple, non-invasive and reliable bedside method and was used for diagnosing the presence and severity of PAD.

The other purpose of study was to compare the frequency of PAD in diabetics taking different treatment modalities.

MATERIAL AND METHODS

It was a hospital based observational Cross-sectional study carried out at Diabetic Research Centre Nishtar Hospital Multan during the period from Dec. 2010 to Dec.2011.

Four hundred and forty three (443) consecutive diabetic patients were included in the study. History, Clinical Examination, Blood Sampling, HBA1C and Doppler's studies for ABI were carried out. Ankle Brachial Index (ABI), which is the ratio of ankle to brachial systolic blood pressure, was used for grading of severity of PAD. A patient with an ABI of <0.9 was classified as having PAD.

RESULTS

A total of 443 diabetic patients were screened for PDA by ABI.

Out of 443 diabetic patients 346(78.1%) were males and 97(21.9%) were females. Table-I.

	No. of cases	%age
Male	346	78.1
Female	97	21.9
Total	443	100

Table-I. Sex distribution

332(74.9%) patients were in age group 35-45 years, having normal ABI. 111(25.1%) patients were in age group of 45-55 years having abnormal ABI. So on the basis of ABI the frequency of PAD was found 25.1%. Table-II.

Out of 111 diabetic patients with abnormal ABI 87(78.4%) were males and 24(21.6%) were females indicating disease predominance in males. Table-III. 97(87.4%) have mild to moderate PAD while

AB	No. of cases	%age
Normal >0.9	332	74.9
Abnormal <0.9	111	25.1
Total	443	100

Table-II. Frequency distribution of PAD on the basis of ABI (n=443)

Sex	No. of cases	%age
Male	87	78.4
Female	24	21.6
Total	111	100

Table-III. Sex distribution of PAD on basis of ABI (n=111)

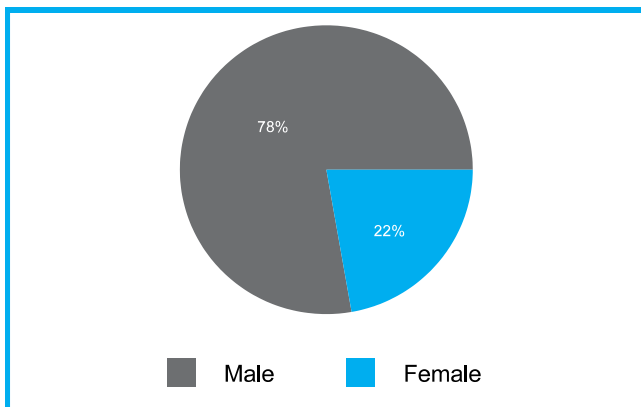


Fig-1.

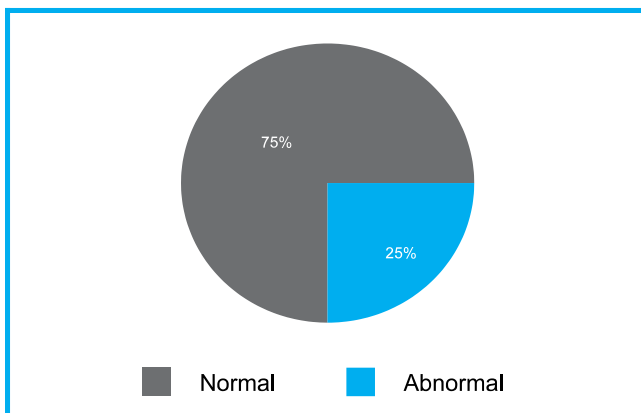


Fig-2.

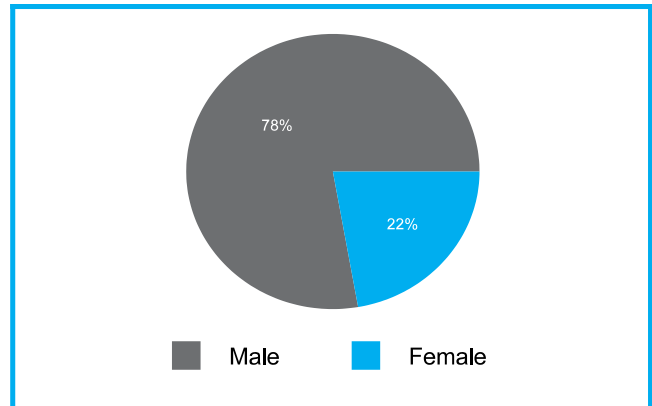


Fig-3.

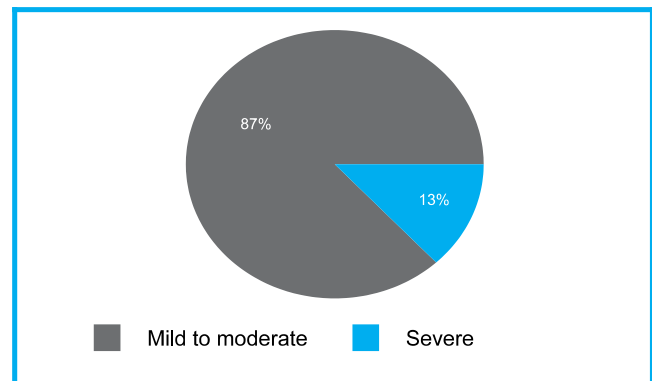


Fig-4.

14(12.6%) have severe PAD. Table IV. Patients with severe PAD were in age group 55 and above and they have longer duration of diabetes. The frequency of PAD was 8.2% with duration of 0 to 10 years and it increased to 36.9% with a diabetic duration of 11 to 20 years and it further increased to 54.9% with duration of >20 years showing relationship of PAD with duration of diabetes. Table-V.

As regards treatment modalities patients having PAD 66(59.4%) were on Oral hypoglycemic drugs and 35(31.6%) on combination therapy of Insulin and Oral hypoglycemic agents. Ten patients (09%) were on insulin therapy indicating PAD was more common in patients who were on Oral hypoglycemic agents. Table-VI.

Severity of PDA	ABI	No. of cases	Age in years	%age
Mild to moderate	0.41-0.90	97	45-55	87.4
Severe	0.00-0.4	14	>55	12.6
Total	-	111	-	100

Table-IV. Severity of PAD on basis of ABI and age (n=111)

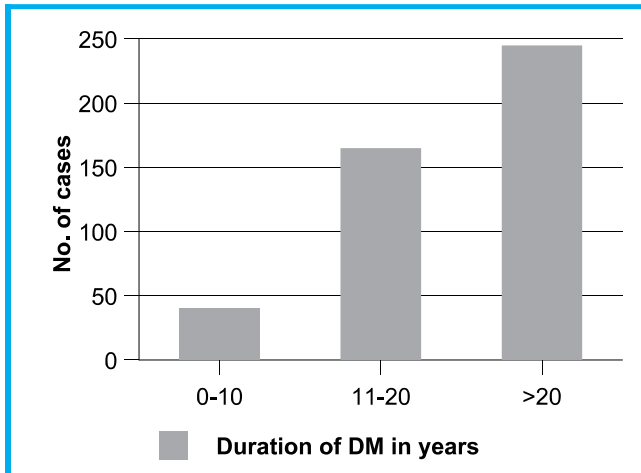


Fig-IV.

Duration of DM (years)	No. of cases	%age
0-10	09	8.2
11-20	41	36.9
>20	61	54.9
Total	111	100

Table-V. Frequency of PAD on the basis of duration of DM (n=111)

DISCUSSION

Various studies have shown that chronic hyperglycemia is an established risk factor for PAD. It has been hypothesized that 10% to 20% of persons with type 2 diabetes mellitus have PAD¹⁸.

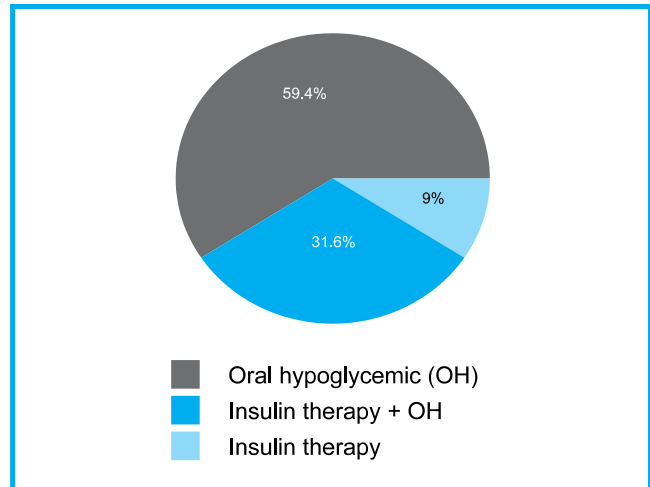


Fig-VI.

Treatment modalities	No. of cases	%age
Oral hypoglycemic agents (OHA)	66	59.4
Insulin therapy + OHA	35	31.6
Insulin therapy	10	9.0
Total	111	100

Table-VI. Frequency of PAD on the basis of treatment modalities

In our study the frequency of PAD was 25%.

A large number of epidemiological and clinical studies have pointed the association of PAD incidence with patient age, sex and duration of diabetes.

In one of the study consecutive 100 patients were screened, prevalence of PAD was 8%. Nearly 60 patient (60% were over the age of 50 years) male predominance was 70%.

In our study also Out of 111 diabetic patients with abnormal ABI 87(78.4%) were males and 24(21.6%) were females indicating disease predominance in males.

The incidence of symptomatic PAD increases with age from about 0.3% / year for men aged 40-55years to about 01 %/year for men aged over 75years¹⁰.

The prevalence of PAD also increases with the duration of diabetes mellitus. The prevalence of PAD was 5.3% with duration of 0 to 10 years. The prevalence of PAD increase to 42.9% with a diabetic duration of between 11 to 20 years and it increase to 50% if the duration was 21-30 years¹¹.

In our study the frequency of PAD is 8.2% with duration of 0 to 10 years and it increases to 36.9% with a diabetic duration of 11 to 20 years and it further increase to 54.9% with duration of >20 years.

The severity of the PAD in clinical picture has been standardized according to the ankle brachial index (ABI) values into four stages:

asymptomatic stage (ABI 0.80 to 0.95), intermittent claudication (ABI 0.5 to 0.8), chronic critical ischemia (ABI 0.3 to 0.5), and foot necrosis/gangrene (ABI \leq 0.2)¹⁹.

In our study among 111 diabetic patients with abnormal ABI 97(87.4%) have mild-moderate PAD while 14(12.6%) have severe PAD.

A cross-sectional study performed by Walters et al found an 8.7% prevalence of PAD among patients who were on insulin therapy and 23.5% among patients who were on oral hypoglycaemic agents²⁰. In our study also frequency of PAD was more in patients who were on oral hypoglycaemic agents.

CONCLUSIONS

The study demonstrates a high prevalence of PAD among people with type 2 diabetes which needs to be appropriately evaluated by the medical professionals. Measurement of ABI, correlates with the clinical condition, is a simple and effective method for

diagnosing the disease early which can help in reducing the risk of complications associated with PAD.

RECOMMENDATIONS

Good glycemic control, early screening & diagnosis of PAD could be a barrier to prevent further CV risk.

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AUTHOR(S):

1. **DR. QAISER MAHMOOD**
Assistant Professor of Medicine,
BVH, Bahawalpur.
2. **DR. NASREEN SIDDIQUE**
Associate Prof. / HOD Community Medicine
Nishtar Medical College, Multan.
3. **DR. AFFAN QAISER**
House Officer
Nishtar Hospital, Multan.

CORRESPONDENCE ADDRESS:

Dr. Nasrin Siddique
4-C, Nishtar Estate,
Nishtar Hospital, Multan.
dr.nasrin.qaiser@gmail.com

Article received on: 18/09/2012
Accepted for Publication: 10/11/2012
Received after proof reading: 21/05/2013