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Original Research Article

TO STUDY THE VARIOUS RISK FACTORS OF PERIPHERAL ARTERIAL DISEASE AND THEIR ASSOCIATION USING ANKLE BRACHIAL INDEX AS A SCREENING TOOL

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Abstract

Background & Methods: The aim of the study is to study the various risk factors of Peripheral Arterial Disease and their association using Ankle Brachial Index as a screening tool.The patients were asked to lay supine for 5 minutes before the ABI was measured, to ensure the accurate blood pressure readings. Blood pressure cuff were placed on the arms and ankles on the arms and ankles and the pulse was detected with a 5 Hz hand held Doppler probe.

Results: Smoking is associated with increased risk of PAD. Out of 78 PAD patients 46 (42.5%) were smokers out of 108. 32 (23.2%) out of 138 nonsmokers. The difference was significant P=0.0406. Out of PAD group 40 patients (51%) had CAD while in non-PAD group 46 patients (27.3%) had CAD. The difference is statistically significant P=0.01.

Conclusion: Assessing our observations, we recommend the routine use of ABI as a screening tool for PAD and atherosclerosis particularly in diabetics. We also recommend that some more and larger studies should be conducted in diabetics and other groups of patients to extrapolate the results to the general Indian population.

Keywords: PAD, association & ABI.
Study Design: Observational Study.

1. Introduction

Epidemiological studies have confirmed an association between diabetes and an increased prevalence of PAD. Peripheral arterial disease in patients with diabetes adversely affect quality of life and is associated with substantial functional impairment[1]. The reduced walking speed and distance associated with intermittent claudication may result in progressive loss of function and long term disability. With more severe disease, critical limb ischemia (CLI) may develop, resulting in ischemic ulceration of the foot and risk of limb loss. Importantly, PAD is associated with a substantial increase in the risk of fatal and non-fatal cardiovascular and cerebrovascular events, including myocardial infarctions and stroke. Patients with diabetes and PAD are at higher risk of lower extremity amputation than those

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without diabetes[2]. Furthermore ,cardiovascular and cerebrovascular event rates are higher in diabetic individuals with PAD than in comparable nondiabetic population.
PAD affects 12 million people in the U.S.; it is uncertain how many of those have diabetes[3]. Data from the Framingham Heart Study revealed that 20% of symptomatic patients with PAD had diabetes, but this probably greatly underestimates the prevalence, given that many more people with PAD are asymptomatic rather than symptomatic[4].
Accurate assessment of prevalence of PAD in the diabetic population is confounded by various factors; the condition is often asymptomatic; peripheral neuropathy may alter pain perception; and the two of the common clinical findings, the absence of peripheral pulses and presence of claudication, are inadequate diagnostic indicators[5].

2. Material and Methods

A total of 240 patients of type 2 diabetes mellitus of both sexes, above 40 years of age, obese as well as non-obese were selected for the study irrespective of their status of diabetes control or the anti-diabetic medication (OHA/Insulin) used.
The patients were asked to lay supine for 5 minutes before the ABI was measured, to ensure the accurate blood pressure readings. Blood pressure cuff were placed on the arms and ankles on the arms and ankles and the pulse was detected with a 5 Hz hand held Doppler probe.
To calculate the ABI, the highest of the systolic blood pressures in the respective ankle was divided by the highest systolic blood pressure in the arm. The lowest ABI obtained for either leg was used in statistical analysis.

Exclusion Criteria:

1. Critically ill.
2. Lower extremity amputation
3. Active leg ulcer or gangrene

3. Result

Table 1: Age distribution among patients of PAD

Age Group	No of Patients	Percentage
40-50	18	23.07%
51-60	18	23.07%
61-70	24	30.7%
71-80	12	15.40%
>80	06	7.6%

Out of the 78 patients who were found to have PAD, maximum number 24 of patients were in the age group of 61-70 i.e. 30.7%.

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Table 2: Correlation of Smoking and PAD

	PAD	No PAD	% PAD	P Value
Smokers	46	62	42.5	**0.0406**
Non smokers	32	106	23.2	

Smoking is associated with increased risk of PAD. Out of 78 PAD patients 46 (42.5%) were smokers out of 108. 32 (23.2%) out of 138 nonsmokers. The difference was significant P=0.0406.

Table 3: Correlation between Duration of Diabetes and PAD

	Mean duration of diabetes in years	Std. Deviation	P Value
PAD	7.096	3.66	
No PAD	4.126	3.74	**0.000122**

Mean duration of diabetes in PAD group was 7.09 (3.66) while that of non-PAD group was 4.126 (3.74). The difference was statistically significant P=0.000122.

Table 4: Association between CAD and PAD

	PAD	No PAD	P Value
CAD	40	46	**0.010**
No CAD	38	122	

Out of PAD group 40 patients (51%) had CAD while in non-PAD group 46 patients (27.3%) had CAD. The difference is statistically significant P=0.01.

4. Discussion

In our study smoking was shown to be strongly correlated with PAD (P=0.04). The fact is supported by Eason et al (2005) who have shown that smoking in diabetics further increases the risk of PAD. Other studies also show the same results[6].

In our study population, the overall frequency of low ABI (≤ 0.90) was 20.0%, and the frequency of low ABI was similar for males and females[7]. Older age, greater number of risk factors, and presence of PAD-related physical findings were associated with increased likelihood of low ABI.

Previous studies have shown that a low ABI has specificity greater than 98% for the diagnosis of PAD and specificity greater than 92% for the prediction of CHD and stroke. The frequency of PAD, as determined by low ABI in adults with no known CVD, varies from 3.7

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to 14% in different populations[8]. However, for people with established CVD or other measures of atherosclerosis, the prevalence of low ABI was reported as 15% to 40%, in accordance with the results of the CAREFUL study. Another significant finding in the present study is that age above 70 years is associated with a 30% prevalence of PAD, independent of the presence of a major risk factor for CVD. This is also in accordance with a previous study with a similar design of a different population.

PAD symptoms were 35% in our population of patients, who were all more than 50 years old. However, although a previous study reported that women with PAD were less likely than men to report symptoms of intermittent claudication, we found no such difference in the present study. In fact, such differences in demographic distributions of screened populations or analysis of populations with higher risk for PAD were indicated to be the causes of the differences in the prevalence estimates[9].

5. Conclusion

Assessing our observations, we recommend the routine use of ABI as a screening tool for PAD and atherosclerosis particularly in diabetics. We also recommend that some more and larger studies should be conducted in diabetics and other groups of patients to extrapolate the results to the general Indian population.

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