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Original Research Paper

Vascular Surgery

A CLINICAL STUDY OF SYMPTOMATIC AND ASYMPTOMATIC PERIPHERAL ARTERIAL DISEASE OF LOWER LIMB IN A TERTIARY HOSPITAL

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ABSTRACT

Introduction: Lower extremity peripheral arterial disease (PAD) is a manifestation of systemic atherosclerosis which affects the lower limb arterial tree causing a significant morbidity and mortality [1,2]. We have undertaken the present study to determine the various risk factors associated with symptomatic and asymptomatic peripheral arterial disease and to know their association with other atherosclerotic diseases like the coronary artery disease (CAD)and cerebrovascular disease (CVD). **Materials and Methods:** A prospective observational study was conducted at Nizams Institute of Medical Sciences (NIMS), in department of vascular surgery on 50 patients. 25 patients with intermittent claudication or symptoms of chronic limb threatening ischemia with ankle brachial index(ABI) <0.9 were categorized into symptomatic PAD group and 25 patients with ABI<0.9 with no symptoms were categorized into asymptomatic group and were studied for various risk factors and associated co-morbidities. **Results:** In the present study, symptomatic and asymptomatic PAD patients had almost similar mean age of presentation (56.08 ± 13.886 ,53.20 ± 12.066 respectively) with male preponderance in both the groups. Smoking was significantly associated with development of PAD along with other risk factors like hypertension ,diabetes and dyslipidemia. **Conclusion:** The present study showed that both symptomatic and asymptomatic PAD share common risk factors and are associated with significant disease burden of CAD and CVD and hence ABI screening for PAD in high risk individuals shall play a role in decreasing the disease burden by early detection and risk factor modification.

KEYWORDS : Peripheral arterial disease, risk factors.

INTRODUCTION

Peripheral arterial disease (PAD) of the lower extremity is one of the spectrum of diseases caused by the process of atherosclerosis. It is caused due to the occlusion of the lower extremity vasculature thereby leading to lower blood supply to the extremity and hence poses a greater risk of limb amputation. Epidemiological studies have estimated that more than 200 million individuals are affected by PAD worldwide[3].

PAD is a chronic manifestation of systemic atherosclerosis and is often associated with other clinical atherosclerotic conditions like coronary artery disease (CAD) and cerebrovascular disease (CVD). These group of diseases usually share a common set of risk factors that play a significant role in the occurrence and progression of the disease. Patients with critical PAD face an annual mortality rate of 25%, due to myocardial infarction and ischemic stroke[4]. Individuals with PAD may be asymptomatic or may present with intermittent claudication or chronic limb threatening ischemia. Ankle brachial index is a widely accepted tool for the detection and classification of patients with PAD. Many studies have shown the importance of ABI as tool for detection of systemic atherosclerosis[5].

There are many studies pertaining to symptomatic PAD as compared with asymptomatic disease. The present study was thus undertaken to determine the various risk factors associated with development of peripheral arterial disease among asymptomatic and symptomatic PAD patients and to find out the association of asymptomatic PAD with other systemic atherosclerotic diseases so as to emphasize the importance of detection of asymptomatic PAD and its early treatment.

MATERIAL AND METHODS

This is a prospective observational study which was carried out on 50 patients attending vascular surgery department in Nizams institute of medical sciences, Hyderabad, after obtaining prior approval from Institutional Ethics Committee. All participants were given an information sheet regarding this study and its purpose , and prior written informed consent was taken from all the participants. 50 patients were grouped into symptomatic and asymptomatic PAD with 25 in each category. All patients with ABI less than 0.9 and with symptoms of intermittent claudication or symptoms and signs of chronic limb threatening ischemia were categorized into symptomatic PAD group. Patients coming to vascular department with non PAD symptoms were subjected to measurement of ABI and among them the patients with ABI less than 0.9 were included under the asymptomatic PAD group.

Patients less than 18 years, pregnant and lactating women and bedridden and noncompliant patients , patients with ABI less than 0.5 and patients requiring primary amputation were excluded from the study. Patient data on demographic variables was collected. All asymptomatic patients were subjected to ECG and carotid vessel doppler to document the systemic atherosclerotic diseases.

Statistical Analysis

Data entry was done by Microsoft Excel 2010 version and analysis using EPI INFO version 7 and SPSS version 21.0. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups. 95% Confidence Interval has been computed to find the significant features. p-value less than 0.05 was considered statistically significant.

RESULTS

The mean age of patients with symptomatic PAD was 56.08 ± 13.886 and the mean age of patients with asymptomatic PAD was 53.20 ± 12.066. Male preponderance was seen. 80% of subjects in symptomatic and 76% of subjects in asymptomatic PAD were males. In the present study there is a significant association (p value: 0.005) between smoking and development of peripheral arterial disease . 88 % of subjects among symptomatic PAD group and 52% among asymptomatic PAD were smokers either in the form of cigarettes or beedis or in the form of chewing tobacco. (Table1)

Table 1 : Smoking/tobacco chewing among symptomatic and asymptomatic PAD

Smoking/ Tobacco Chewing	Symptomatic PAD (n=25)		Asymptomatic PAD (n=25)		TotaL (N= 50)
	Number	Percentage	Number	Percentage	
YES	22	88%	13	52%	35
NO	03	12%	12	48%	15
TOTAL	25	100	25	100	50

P value : 0.005

On studying the various risk factors for the development of PAD, a significant association was seen with diabetes mellitus, hypertension, dyslipidemia and also with raised CRP levels among the symptomatic PAD group. Among the asymptomatic group majority had diabetes mellitus and hypertension. (Table 2)

Table 2: Risk factors among symptomatic and asymptomatic PAD

Risk factors	Symptomatic PAD (n=25)		Asymptomatic PAD (n=25)	
	Number	Percentage	Number	Percentage
Diabetes	19	76%	25	100%
Hypertension	15	60%	04	16%
Dyslipidemia	08	32%	02	08%
Raised CRP levels	04	16%	00	0

P value <0.05

Among the symptomatic group of PAD patients 84% had a non sedentary life style as compared with 28% among the asymptomatic group . This might explain the reason for non manifestation of the symptoms in spite of the presence of disease in asymptomatic group. (Table 3)

Table 3: Type of lifestyle among symptomatic and asymptomatic PAD

Type of lifestyle	Symptomatic PAD(n=25)		Asymptomatic PAD(n=25)	
	Number	Percentage	Number	Percentage
Sedentary	4	16%	18	72%
Non Sedentary	21	84%	07	28%
Total	25	100%	25	100%

P value <0.05

Patients with symptomatic PAD had other associated atherosclerotic diseases. Among 25 patients with symptomatic PAD, 40% had coronary artery disease and 32% had associated cerebrovascular disease. Nearly 16% had both CAD and CVD. On evaluation of asymptomatic patients, out of 25 patients, 16% had abnormal ECG and 24% patients had carotid artery plaques on neck vessel doppler study and 4% had both ECG abnormality and carotid artery plaque.

Table 4:Co-morbidities among symptomatic PAD patients

Comorbidities	Symptomatic PAD (n=25)	
	Number	Percentage
Coronary Artery Disease (CAD)	10	40%
Cerebrovascular Disease (CVD)	08	32%
CAD+CVD	04	16%
None	03	12%

Table 5: Abnormal ECG and carotid vessel doppler among asymptomatic PAD patients

ECG and Carotid doppler abnormality	Asymptomatic pad (n=25)	
	Number	Percentage
ECG abnormality	04	16%
Carotid doppler abnormality	06	24%
Both abnormal	01	04%
No abnormality	14	56%

DISCUSSION

Peripheral arterial disease of the lower limb is an atherosclerotic occlusive disease of the lower limb vasculature contributing to a significant morbidity and mortality worldwide. Globally, aging combined with the growing prevalence of risk factors such as diabetes, smoking, hypertension, dyslipidemia, and obesity contributes to an increased prevalence of PAD[6]. Increasing age is a significant risk factor associated with PAD. In the present study, symptomatic and asymptomatic PAD patients have almost similar mean age of presentation (56.08 ± 13.886 ,53.20 ± 12.066 respectively) with male preponderance in both the groups. Smoking is significantly associated with development of peripheral arterial disease (p value- 0.005) and the number of co-morbidities like hypertension, coronary artery disease and cerebrovascular disease are more among patients with symptomatic PAD .

Stoffers et al.[7] reported that up to three-quarters of patients with PAD were asymptomatic. Reasons for lack of symptoms may include lower severity or burden of disease, adequate collateral artery reserve, limited levels of activity among older subjects or those with sedentary life style . In the present study, among the symptomatic group of PAD patients 84% had a non sedentary life style as compared with 28% among the asymptomatic group. 72% of asymptomatic patients had a sedentary life style. Many trials showed that both symptomatic and asymptomatic patients with PAD have an increased mortality compared to those without PAD.[8] Trials have also shown ABI as a marker of PAD which predicts cardiovascular and overall mortality. Diehm et al.[9] showed that the 5 years all cause mortality was 24.1% in patients with symptomatic PAD, 19.2% in patients with asymptomatic PAD (low ABI), and 9.5% in patients without PAD; while others reported that the estimated five-year mortality in patients with PAD was 30% [10,11]. In the present study the asymptomatic group of patients were evaluated for the presence of other atherosclerotic disease. ECG was taken for all the asymptomatic group of patients and abnormal findings like presence of Q waves, ST segment changes, significant ectopic beat, left ventricular hypertrophy, bundle branch blocks were recorded. Similarly a carotid vessel doppler study was also performed to see for the presence of carotid artery plaque disease which is one of the main cause for occurrence of cerebrovascular events. Among the 25 asymptomatic patients, 16% had abnormal ECG,24% had carotid artery disease and 4% had both . This shows the importance of early detection of PAD among high risk individuals based on factors like smoking, advanced age, associated co-morbidities like diabetes, hypertension and thereby preventing progression of atherosclerotic process affecting various systems of the body.

CONCLUSION

The risk factors among the symptomatic and asymptomatic PAD remain comparable, although the epidemiological data about the asymptomatic PAD group is limited. . Advanced age, male gender, dyslipidemia, hypertension and diabetes mellitus are the most common risk factors associated with symptomatic PAD. Certain inflammatory markers like CRP was also found to be associated with symptomatic PAD. Studies have shown that up to one third of asymptomatic PAD population had manifestations of atherosclerotic symptoms affecting the cardiovascular and cerebro-vascular systems. This shows that among the asymptomatic PAD population there are patients with a wide range of arteriosclerotic burden and risks, with some patients suitable for preventive interventions . Though there is limited data on benefits of life style modifications and medical prophylactic treatment in asymptomatic PAD, screening certain high-risk populations for PAD and followed by life style modifications along with

medical management may reduce morbidity and mortality and hence the healthcare burden of the disease.

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