

Prevalence of peripheral arterial disease with risk factors and Ankle brachial index (ABI) correlation - A study in a tertiary health care centre¹Dr. Sarvesh Sharma, Professor, CTVS Department, S.P. Medical College, Bikaner.²Dr. Parul, Resident, Surgery Department, S.P. Medical College, Bikaner.³Dr. Mukesh Deora, Resident, Surgery Department, S.P. Medical College, Bikaner.**Corresponding Author:** Dr. Mukesh Deora, Resident, Surgery department, S.P. Medical College, Bikaner.**How to citation this article:** Dr. Sarvesh Sharma, Dr. Parul, Resident, Dr. Mukesh Deora, “Prevalence of peripheral arterial disease with risk factors and Ankle brachial index (ABI) correlation - A study in a tertiary health care centre”, IJMACR– September– 2026, Volume – 9, Issue – 5, P. No. 07 – 12.**Open Access Article:** © 2026 Dr. Mukesh Deora, et al. This is an open access journal and article distributed under the terms of the creative common’s attribution license (<http://creativecommons.org/licenses/by/4.0>). Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.**Type of Publication:** Original Research Article**Conflicts of Interest:** Nil

Abstract**Background:** Peripheral arterial disease (PAD) is an obstructive disease of peripheral arteries. This study was aimed to study prevalence of PAD and risk factors evaluation in asymptomatic and symptomatic patients attending CTVS department OPD, S.P. medical college, Bikaner.**Method:** This study was conducted on 900 patients visiting CTVS OPD, who gave consent for inclusion in study. After taking history of patients, physical examination was done, Ankle Brachial Index (ABI) was measured, relevant investigations were done. The diagnosis of PAD was made by ABI less than 0.9 (ABI <0.9).**Results:** We had 900 patients in our study. Among them 187 (20.77%) were suffering from PAD. 138 (15.3%) patients were asymptomatic in our study but having PAD.

Diabetes and smoking were found significantly associated with PAD.

Conclusion: Peripheral arterial disease is significantly associated with Diabetes and smoking. ABI can be used as an early detection tool in asymptomatic patients of PAD.**Keywords:** Peripheral Arterial Disease (PAD), Ankle Brachial Index (ABI).**Introduction**

Peripheral arterial disease (PAD) occurs due to obstructive pathology in major arteries. Generally, peripheral arteries include arteries of body except coronary arterial system and brain vascular system. Most common cause of PAD is atherosclerosis.

PAD is present mostly in lower limbs, due to obstructive disease below aortic bifurcation. PAD may be present as asymptomatic incidental finding, with intermittent claudication (IC), rest pain to critical limb ischemia,

gangrene leading to permanent disability or limb loss ¹. Both symptomatic and asymptomatic PAD represents itself as an increase risk factor for cardiovascular morbidity and mortality ².

Various risk factors for PAD are atherosclerosis, cigarette smoking, diabetes mellitus etc. Diagnosis of PAD can be made on the basis of clinical history, clinical examination, investigations. Ankle brachial index (ABI) helps in assessing PAD.

Normal value of ABI is in between 0.9 to 1.3. PAD is defined as if ABI less than 0.9 (ABI <0.9)³. ABI between 0.7 to 0.9 mild PAD, 0.5 to 0.7 moderate PAD, and less than 0.5 severe PAD. Thus ABI test helps in identifying PAD in early stages before symptoms appear. A study by Mc Dermott et al. reported that patients with asymptomatic PAD had poor functional performances and quality of life ⁴.

In this study we intended to estimate the prevalence of PAD (whether asymptomatic or symptomatic), on the basis of ABI and association of risk factors of PAD, among the patients attending CTVS department OPD, S.P. medical college, Bikaner.

Material and Methods

This is a descriptive cross sectional study conducted among 900 patients visiting OPD of department of CTVS, S.P. medical college, Bikaner from 1st January 2024 to 31st December 2025. All patients above 20 years of age were included in this study, who gave consent for participating in study.

Exclusion criteria's

- Patients unwilling to participate.
- Diagnosed case of arteritis.
- Gross pedal edema, severe aortic regurgitation, congestive heart failure.

After getting informed consent from participating, detailed history of patient was taken, like basic socioeconomic and demographic details, physical activity, dietary habits, smoking, intermittent claudication, hypertension, diabetes and coronary artery disease was collected.

Physical examination was done. We defined diabetes mellitus as fasting glucose value of > 7 mmol/L (126 mg/dl) and/or if patient was taking medicine for diabetes⁵. We defined hypertension as blood pressure > 140 mm Hg systolic and/or > 90 mm Hg diastolic and/or taking drugs for hypertension ⁶

After taking history and physical examination, we did ABI measurement of patient. Ankle brachial ratio (ABI) was taken as the ratio of systolic blood pressure in lower limb at the level of ankle to the systolic blood pressure in the upper limb at the brachial artery level. Blood pressure was measured by conventional cuff method (auscultation) and by arterial Doppler.

ABI was calculated in all four limbs and defined as the ratio of the lower of the systolic pressure at either ankle to the higher of the systolic pressure in the brachial arteries. ABI of less than 0.9 was taken as the cutoff point for diagnosing PAD.

We categorized data in four groups on the basis of ABI and distribution of different variable studied. Distribution was expressed as a percentage of total numbers in population and in actual numbers. Relations between variables was analysed using Pearson's correlation, where correlation(r) value greater than 0.3 and P value of < 0.05 were considered significant correlation.

Results

Table 1: Age Group

Variable	Ankle Brachial Index				Total
	Less than 0.9	0.91-.99	1.0-1.4	More than 1.4	
Age group in years					
20-30	2	10	24	0	36
31-40	12	56	68	4	140
41-50	22	50	86	6	164
51-60	54	45	116	08	245
61-70	75	45	84	26	230
71& above	22	4	56	2	84
Total	187	233	434	46	900

In this study, we included 900 patients attending CTVS OPD, S.P. Medical college, Bikaner from 1st January 2024 to 31st December 2025. Out of 900 patients 187(20.77%) were having PAD. Majority of patients 75 (40.10%) in numbers were in 61-70 years of age group. Among 900 total patients 684(76%) were males and 216 (24%) females were suffering from PAD.

Table 2: Gender

Variable	Ankle Brachial Index				Total
	Less than 0.9	0.91-.99	1.0-1.4	More than 1.4	
Gender					
Male	148	187	326	23	684
Female	39	46	108	23	216
Total	187	233	434	46	900

About ankle brachial index, we grouped all patients in four groups, patients having ABI < 0.9 were 187 (20.77%), 0.91 to 0.99 were 233(25.88%), 1.0 to 1.4 were 434 (48.22%), and more than 1.4 were 46(5.11%) in numbers. We considered PAD in patients having ABI less than 0.9.

In our study symptoms of intermittent claudication were present in 58 (6.4%) out of 900 total patients. Among 187 patients of PAD, 49(26.2%) were having intermittent claudication and only 9 (1.2%) out of 713, who were not having PAD.

Table 3: Intermittent Claudication

Variable	Ankle Brachial Index				Total
	Less than 0.9	0.91-.99	1.0-1.4	More than 1.4	
Intermittent claudication					
Present	49	5	3	1	58
Absent	138	228	431	45	842
Total	187	233	434	46	900

In this study 362(40.2%) patients had diabetes among total 900 patients, in PAD group out of 187 patients, 107 (57.2%) were suffering from diabetes. Coming to the hypertensive disease 442 (49.1%) were hypertensive out of 900 patients and 92 (49.2%) were hypertensive in PAD group.

Table 4: Diabetes

Variable	Ankle Brachial Index				Total
Diabetes	Less than 0.9	0.91-0.99	1.0-1.4	More than 1.4	
Present	107	102	132	21	362
Absent	80	131	302	25	538
Total	187	233	434	46	900

Table 5: Hypertension

Variable	Ankle Brachial Index				Total
HTN	Less than 0.9	0.91-0.99	1.0-1.4	More than 1.4	
Yes	92	124	198	28	442
No	95	109	236	18	458
Total	187	233	434	46	900

Among all 900 patients, 352 (39.1%) had never history of smoking or quit smoking > 10 years back, 297 (33%) quit smoking less than 10 years back and 251 (27.9%) smoked more than 1 cigarette per day. PAD was present in 37 (10.11%) patients had never smoked or quit smoking > 10 years back, 52 (17.5%) in quit smoking within 10 years and 98 (39%) in whom smoked >1 cigarette per day. In short in our study 98 (39%) smokers had PAD and 89 (13.7%) nonsmokers had PAD.

Table 6: Smoking

Variable	Ankle Brachial Index				Total
Smoking	Less than 0.9	0.91-.99	1.0-1.4	More than 1.4	
Never or quit > 10 years	37	94	207	14	352
Quit < 10 years	52	83	146	16	297
Smoking > 1/ day	98	56	81	16	251
Total	187	233	434	46	900

In our study 367 (40.8%) patients do not take alcohol, 235 (26.1%) drink socially and 298 (33.1%) consume alcohol on regular basis. In our PAD group, the numbers were 60 (32%) of non alcoholic, 57 (30.5%) drink socially, 70 (37.5%) drinks regularly.

Table 7: Alcohol Consumption

Variable	Ankle Brachial Index				Total
Alcohol Consumption	Less than 0.9	0.91-.99	1.0-1.4	More than 1.4	
Never	60	83	208	16	367
Social	57	53	109	16	235
Regular	70	97	117	14	298
Total	187	233	434	46	900

Family history of having risk factors like DM, HTN, CAD, we found that out of total 900 patients, DM was present in 114, 85 had HTN, and 40 gave history of CAD.

Table 8: Family History

Variable	Ankle Brachial Index				Total
Family history	Less than 0.9	0.91-.99	1.0-1.4	More than 1.4	
DM	48	12	52	2	114
HTN	30	8	44	3	85
CAD	18	4	18	0	40

Discussion

In our study, 187 (20.77%) patients out of 900 had PAD. In other studies, it has been reported between 9 to 29%⁷. In our study prevalence of PAD increased with increase of age, from 2 (1.1%) in 20-30 years age group, 12(6.4%) in 31-40 years age group to 75(40.10%) in 61-70 years age group. Most of other studies also reported linear relationship between age and PAD⁸. In this study we had 684 (76%) male and 216 (24%) female patients. 148 (21.6%) male patients had PAD and 39(18.1%) females had PAD. Similar types of results were found in other study⁹.

Intermittent claudication is an important aspect of assessing occurrence of PAD in our study, out of 900 58(6.4%) had symptoms of PAD, of these 49 (26.2%) patients had PAD (187 total). 9 (1.2%) patients had absence of PAD (713 total). This result is comparable to most of other studies¹⁰.

In our study among the patients diagnosed PAD, 26% were having symptoms, hence screening with ABI detected 74% of asymptomatic PAD subjects. Taking into the whole study population in consideration 138 (15.3%) out of 900 had asymptomatic PAD. Stoffer's ET al. have reported a prevalence of 6.9% in asymptomatic PAD¹¹. In above study out of 362 diabetic patients 107(29.55%) had PAD and P value for diabetes as a risk factor was statically significant ($P < 0.05$). Diabetes is a well-established risk factor for PAD^{12, 13}.

In our study 251 (27.9%) patients were smokers all of them were male. PAD was present in 98 (39%) of smokers in comparison of 89 (13.7%) of nonsmoker or quit smoking, which was significantly higher in smoker than in nonsmokers. One study has shown that PAD is 2.5 times more common in smokers¹⁴.

The present study showed 442(49.1%) patients were hypertensive among total 900 patients. In PAD group 92 (49.2%) patients were hypertensive. This result shows statically not significant.

In our study we found that among those, who consumed alcohol had PAD in 23.5 % cases and those who never consumed alcohol had 19.5%. this was not statically significant.

Conclusion

Peripheral arterial disease is significantly associate with smoking, diabetes. Ankle brachial index (ABI) is a well-established test for the diagnosis of PAD. It's advantages are non- invasive, can be carried at any place. Early diagnosis in asymptomatic patients of PAD can be done by ABI and it helps in changing the natural history of disease by early intervention. ABI is also having prognostic significance in PAD patients because lower ABI is associated with poor outcome.

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