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Prevalence of Peripheral Vascular Disease and its Risk Factors in Rural Adults in Eastern India

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ABSTRACT
Vascular Disease of the Periphery refers to Conditions affecting blood vessels that are not directly related to the heart. Peripheral arterial disease and lower limb venous insufficiency are the most common conditions. In India, The population level, prevalence, and risk factors for these diseases have received little attention. To determine the prevalence of Peripheral Arterial Disease in a rural population, as well as the prevalence of Chronic Venous Disease among persons living in distant areas. The present study was a hospital-based retro-spective comparative study. This study was conducted from June, 2021 to July, 2022 at department of Cardiology, Nil Ratan Sircar Medical College and Hospital, Kolkata, West Bengal. Total 575 patients were included in this study. In our study population, 15.3% of participants were using diabetes medications. Another large-scale cross-sectional survey found an estimated frequency of 10.4%, with 15 individuals (1.4%) having pre-existing CAD. According to a study on the prevalence of CHD in a similar cohort, 0.7% of patients had pre-existing CAD. PAD was significantly linked to older age (>60 years) and male gender, whereas Chronic Venous Disorders were linked to increasing parity.

INTRODUCTION

Conditions that affect vessels that are not directly related to the heart are referred to as peripheral vascular disease[1]. Peripheral arterial disease and lower limb venous insufficiency are the most common conditions. The prevalence and risk factors for these diseases have not been well examined at the population level in India.

Atherosclerosis is a broad disease affecting predominantly the middle and big arteries. The buildup of fibrin and lipids between the tunica intima and the vessel media causes vessel lumen constriction. As a result, blood flow decreases, potentially leading to ischaemia. This is known as peripheral arterial disease if it develops in a non-cardiac or brain channel. It is commonly diagnosed using the ankle brachial pressure index. The Ankle brachial pressure index less than 0.90 may indicate peripheral arterial disease[2]. An ABI greater than 1.30 indicates non-compressible vessels as well as arterial disease, particularly systemic arterial disease[3].

In terms of forecasting the ABI has a U-shaped curve for Mortality from any cause and mortality from cardiovascular disease. Low levels (adjusted OR 1.69, 95% confidence interval 1.34-2.14) and high levels (adjusted OR 1.77, 95% confidence interval 1.48-2.13) both predicted mortality[4].

Reduced peripheral blood flow is caused by thrombosis, inflammation, and, most typically, atherosclerosis. The vast majority of people with peripheral artery disease go unnoticed until they develop gangrene and lose a limb. Sabiston's Textbook of Surgery states that 20-50% of patients with Peripheral Arterial Disease (PAD) are asymptomatic. Only 10-35% of patients have claudication pain, and the remaining 20% have vague local symptoms. PAD diagnosis is crucial since patients with PAD are at 4-5 times the risk of having a heart attack or stroke as the age-matched group[5]. Even for secondary prevention, these asymptomatic patients become aware of their situation too late. They continue to smoke and are noncompliant with diabetic meds because they are asymptomatic and lead a pleasant life and hence see no reason to modify their current lifestyle. Diabetes, male gender, smoking, hypertension, dyslipidaemia, race, hyperhomocysteinemia and renal illness were all found to be risk factors in the study have all been associated to an elevated risk of PAD[5]. According to one study, the general urban population had a 3.2% prevalence of PAD. The primary risk factors identified were age and hypertension. The frequency was 7.8% in people with known diabetes[6]. According to one study, PAD was found in 3.2% of the general urban population. The primary risk factors identified were age and hypertension. The frequency was 7.8% in people with known diabetes[7].

MATERIALS AND METHODS

- **Study design:** A Hospital-Based Retro-Spective Comparative Study
- **Study Place:** Nil Ratan Sircar Medical College and Hospital, Kolkata, West Bengal.
- **Duration of study:** June, 2021 to July, 2022
- **Sample size:** 575

Inclusion criteria: Adults over the age of 18 who had been permanent residents.

Exclusion criteria: Bilateral upper/lower limb amputees/limb amputations

Study variables: The Ankle-Brachial Index (ABI) was used to diagnose peripheral artery disease. ABI was determined using a handheld Doppler device and an aneroid sphygmomanometer.

RESULT AND DISCUSSION

Five hundred and seventy five patients were included in this study. The bulk of Women who practised Hinduism and were literate participated in the study. We can estimate that 36.9% have completed primary education, 13.6% are illiterate and 3.05% can read alone. Only two-thirds of survey participants are literate, which is comparable to the 73.54% rural literacy rate (Table 1)[8].

About 34.7% of the males had smoked at some point in their lives and 56.1% had consumed alcohol. In a study conducted, This was lower than the projected proportion of men's current smoking (37.6%) and alcohol intake (72.4%).

The mean The average height and weight of the study population were 157 cm and 61 kg, respectively. The average BMI of the subjects was 24.72 kg m^{-2}. This matches the findings of another study conducted in a separate rural area of India, which discovered a mean BMI of 24.5 kg m^{-2}[9].

This study's overweight prevalence is similar to the findings of a 2015 study, which found a 15.2% prevalence of adults having a BMI of 23.00-24.99 kg m^{-2}. Another study discovered that 39.64% of people in rural India had a BMI more than 2510[10], which is comparable to our study results (45.4%) (Table 2).

Hypertension medication was used by 14.6% of our study population. A prevalence of 21.4% was reported in a study.

In our study population, 15.3% of participants were using diabetes medications. Another large-scale cross-sectional survey found an estimated frequency of 10.4%, with 15 individuals (1.4%) having pre-existing CAD. A research on the prevalence of CHD in a similar population found that 0.7 percent of individuals had pre-existing CAD.

Table 1: Distribution of all parameter

	BMI (WHO Asia-Pacific)	Frequency	Percent
BMI (WHO Asia-Pacific)	Underweight (<18.5)	59.5	10.339
	Normal (18.50-22.99)	164	28.497
	Overweight (23.00-24.99)	96.5	16.768
	Obese (>25.00)	255	44.396
	Total	575	100
History of hypertension	Yes	84	14.596
	No	491.5	85.404
	Total	575	100
History of diabetes mellitus	Yes	70.5	12.25
	No	505	87.75
	Total	575	100
Ischaemic heart disease	Yes	7.5	1.3032
	No	568	98.697
	Total	575	100
Cerebrovascular accident	Yes	5.5	0.9557
	No	570	99.044
	Total	575	100

Table 2: Bivariate analysis for chronic venous disorder

Factors	CVD	%	No CVD	%	p-value
Sex					
Male	20	24.39	202	37.83	0.1650
Female	21	25.61	332	62.17	
Age					
>60	12	14.63	127	23.78	0.4291
<60	29	35.37	407	76.22	
Parity					
0 And 1	1	1.22	75	14.04	0.0459
>1	21	25.61	257	48.13	
Smoking					
Ever	7	8.54	68	12.73	0.4266
Never	34	41.46	466	87.27	
Diabetes					
Yes	6	7.32	64	11.99	0.6171
No	35	42.68	470	88.01	
Hypertension					
Yes	8	9.76	76	14.23	0.3562
No	33	40.24	458	85.77	
Frequency of fruit intake					
Less than daily	26	31.71	418	78.28	
Daily	15	18.29	116	21.72	
CAD					
Yes	1	1.22	7	1.31	0.5522
No	40	48.78	527	98.69	
Frequency of vegetable intake					
Less than daily	3	3.66	30	5.62	0.6521
Daily	38	46.34	504	94.38	
Alcohol					
Ever	11	13.41	111	20.79	0.3617
Never	30	36.59	423	79.21	

One percent of the entire study sample had had a stroke at some point in their lives. Another study found that CVA confirmed by CT/MRI results occurred at a rate of 1.3 per 1000 people.

The study population had a 3.9% prevalence of intermittent claudication. An earlier study in rural India utilising the Rose questionnaire found that 3.9% of people had classical claudication[11].

About 7.3% (95% CI 5.8-8.9%) of the study sample had Chronic Venous Disorder (CVD). As previously said, it has been estimated that 15-21% of our population suffers from Chronic Venous Disorders.

The study population's prevalence of abnormal ABI was assessed to be 2% (95% CI 1.3-3%). According to other research, the prevalence of PAD ranges from 3-8%.

Arterial disease: The NHANES study, as previously noted, revealed the PAD prevalence in each age group is as follows. In this study, increasing age was revealed to be a with an adjusted Odds Ratio of 3.11 (1.25-7.72), diabetes is a substantial risk factor for peripheral vascular disease.

In this study, the prevalence of PAD in men over the age of 18 was 3.7%, while it was 1.0% in women of the same age. Despite the fact that it is in a different group (age >65), the findings are similar to those in previous research described above[12]. A history of Diabetes Mellitus was found to be substantially linked with PAD in a bivariate study (OR 3.25, 95% CI 1.31-8.03). When age, gender, smoking and In logistic regression, all hypertension were examined and the connection was shown to be insignificant (adj OR 2.23, 95% CI 0.77-6.42).

Similarly, in bivariate analysis, in logistic regression, HTN was found to be substantially linked with PAD (OR2.63, 95% CI 1.06-6.49) but not with PAD (adj OR 1.14, 95% CI 0.38-3.37).

Another risk factor was smoking, which was significant in bivariate but not in regression analysis (OR 3.01[1.22-7.45] vs adj OR 1.27[0.45-3.54]).

During bivariate analysis, the most important risk factors were age and gender, which acted as confounders.

The aberrant ABI group had a significantly higher mean age (10.5, 95% confidence interval 3.8-17.2) than the normal ABI group.

In patients with aberrant ABI, LDL was found to be considerably lower (-19.9, 95% CI -39.0 to -0.7). There have been no earlier reports of similar findings.

In any of the other blood tests, there were no significant changes.

Venous disease: Multigravida women were shown to be more prone to suffer from persistent venous problems than nulliparous women and women who have only had one child in the previous. Women with fewer children were 92% (OR 0.08, 95% CI 0.01-0.60) less likely than women with more children to suffer venous disease.

Though there was no statistically significant association between obesity and chronic venous illness, the CVD group's mean BMI was significantly higher (Mean Difference 1.60 kg m^{-2}, 95% CI 0.44-2.76).

The CVD group was also substantially taller (Mean Difference 2.6 cm, 95% confidence interval 0.5-4.7) and heavier (Mean Difference 6.0kg, 95% confidence interval 2.9-9.2).

ABI (0.03, 95% CI 0.00-0.05) was similarly substantially higher in the CVD group.

CONCLUSION

The prevalence of Peripheral Arterial Disease was 2% (95% confidence interval: 1.3%-3%).

Chronic venous disorders were shown to be 7.2% prevalent (95% CI: 5.7-8.8%).

PAD was discovered to be substantially associated with advanced age (>60 years) and male gender.

CVD were found to be substantially related to greater parity.

The mean People with Chronic Venous Disorders had considerably increased height, weight and BMI.

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