



THE PREVALANCE OF PERIPHERAL ARTERIAL DISEASE IN LONG STANDING ASYMPTOMATIC SHOP-WORKERS BETWEEN THE AGE GROUP OF 35-45 YEARS USING OSCILLOMETRIC TECHNIQUE: A PILOT STUDY

Physiotherapy

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ABSTRACT

Background: Peripheral arterial disease is a type of irreversible cell injury to the tissue. Prolonged standing is associated with many health affections related to MSK injury, psychology, mental stress and cardiovascular disease such as DVT. Assessing Ankle-brachial index by Oscilometric technique is an easy, useful tool for screening the population for the prevalence of PAD. This study aims to identify prevalence of PAD in long standing workers using ABI with Oscilometric technique.

Method: In this study, 20 long standing workers were selected according to the selection criteria, the participants were installed in a quiet room, or sitting for at least 5 min before measurement. Measurement of systolic pressures of the four limbs were taken in all patients. 3 cycles of measurement (right arm, right ankle, left ankle, left arm) were repeated.

Results: In our study, prevalence was found to be 23%, out of which 15% were having mild PAD, 8% having moderate PAD. Out of 20 individuals, 14 individuals had a normal score ABI, 6 individuals were found to have lower score- all 6 having bilateral involvement. 2 of them having moderate and mild involvement in respective lower extremities.

Conclusion: Our study concluded that standing for long period has a considerable impact on lower limb blood circulation, and intervention can be made to prevent the circumstances.

KEYWORDS

Peripheral arterial disease, ankle brachial index, long standing workers.

INTRODUCTION:

Peripheral arterial disease (PAD) is chronic arterial disease mainly involving the lower extremities caused by atherosclerosis. The PAD results in intermittent claudication manifested as excruciating pain. The throbbing muscle pain typically occurs distal of an extremity. Frequently femoral and popliteal arteries are affected, the pain of intermittent claudication is most commonly localized to the calf region. Blockage of the distal aorta and its bifurcation into the two iliac arteries may cause pain in the region of buttocks, hips, thighs, or the deep back muscles.⁽¹⁾

Persons with PAD may not walk or even able to stand for a while. comorbidities such as metabolic disease or arthritis, may go unnoticed, or may have sufficient collateral arterial channels to tolerate their arterial obstruction. sedentary hours and reduced outdoor walking speed are associated with faster declines in functioning and adverse calf muscle changes in PAD.⁽¹⁾

Every living mammalian tissue requires oxygenated blood for its survival. If the oxygen rich blood flow to the lower extremities cannot meet the resting tissue metabolism demands, critical lower extremity ischemia. Chronic arterial insufficiency ulcers commonly in the region of foot. Dry Mummified, black toes covered by a flaky layer of skin is a typical representation of gangrene caused by oxygen deficit.

Suppuration often develops with time and dry gangrene changes to wet gangrene.⁽¹⁾ Many workers in the hardware, grocery, fast food shops, are required to stand for long periods of time without being able to walk or sit during the work shift.⁽⁵⁾

Methodology:

Participants:

Individuals were taken who were willing to participate in the study were taken. All the subjects were screened as per the inclusion and the exclusion criteria. The subjects were explained about the procedure and the purpose of this study. A written consent form was taken from all the subjects prior to the study. All the subjects were interviewed and evaluated to understand their work/tasks and demands. Inclusion criteria was Individuals in the age group of 35-45 years. Long standing shopkeeper who are standing i.e. 50% of their working hours. Those with Recent trauma to the upper and lower limb, Surgery to lower limb and spine, Lumbar canal stenosis, Cardiovascular Disease and Diabetics Mellites, were excluded.

Procedure:

The participant was installed in a quiet room, or sitting for at least 5

min before measurement. Right and left arm and ankle (posterior tibial artery and dorsalis pedis artery) systolic blood pressures were measured.

Measurement of systolic pressures of the four limbs were taken in all patients. 3 cycles of measurement (right arm, right ankle, left ankle, left arm) were repeated.

The ABI of each leg were calculated by dividing the higher of the Dorsalis pedis or Posterior Tibial pressure by the higher of the right or left arm blood pressure. Further the results were compared with the standard values.

Normal ABI ranges from 1.0 — 1.4

Values above 1.4 suggest a non-compressible calcified vessel.

An value below 0.9 is considered diagnostic of PAD.

Values less than 0.5 suggests severe PAD.

MATERIALS:

- Oscilometric blood pressure apparatus



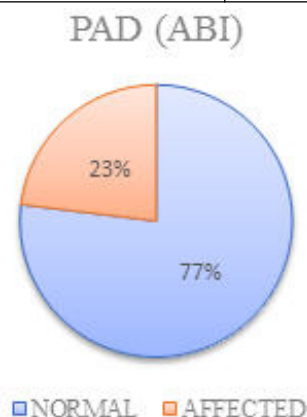
- Suitable clothing.
- Pen and paper.
- Chair.
- Table.

RESULTS:

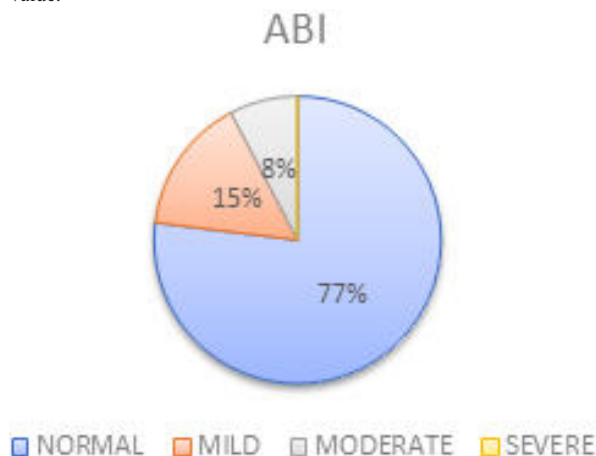
In our study, prevalence was found to be 23%, out of which 15% were having mild PAD, 8% having moderate PAD. Out of 20 individuals, 14 individuals had a normal score ABI, 6 individuals were found to have lower score- all 6 having bilateral in involvement. 2 of them having moderate and mild involvement in respective lower extremities.

Data Analysis:

	NO. OF PATIENTS
TOTAL PATIENTS	20
NORMAL	14
MILD	6
MODERATE	2
SEVERE	0
FALSELY ELEVATED	0
TOTAL AFFECTED	6

**Graph 1:** Representation Of Affected And Unaffected Percentage

Among all, 23% were affected and 77% were having a normal ABI value.

**Graph 2:** Representation Of Affected With Their Categorization According To Standard Value Of ABI

The above pie chart shows that among the 23% which are affected from pie chart no. 1; 15% were categorized as mild, 8% as moderate and 0% as severe.

DISCUSSION:

This is one of the smaller scale studies conducted in a western suburb of Mumbai, metropolitan city to assess actual prevalence of PAD long standing workers.

Although this study was done on a fraction of population, the results of our study show a considerable percentage of long-standing workers having PAD.

More importantly, this study excluded individuals having some of the diseases associated with PAD still, there was a high prevalence in these asymptomatic individuals.

20 Subjects were taken according to the inclusion and exclusion criteria, they were explained the assessment technique in the best manner possible, taken consent and performed the assessment, after which data recording was done.

In our study, prevalence was found to be 23%, out of which 15% were having mild PAD, 8% having moderate PAD. Graph 1 show this representation above.

Out of 20 individuals, 14 individuals had a normal score ABI, 6 individuals were found to have lower score- all 6 having bilateral in involvement. 2 of them having moderate and mild involvement in respective lower extremities.

Our data coincide with previous studies that incidence of PAD grows with age, all individuals having a lower score have an average age of 44.1 years.

Another statistic shows these 6 individuals having lower ankle pressures, also had higher brachial systolic although it was within normal range.

A study done by Schroll and Munck reported that the prevalence of PAD was 16% in men and 13% in women aged 60 years Crique *et al.* showed that the prevalence of PAD was 5.6% in persons aged 38 to 59 years, 15.9% in persons aged 60 to 69 years old, and 33.8% in persons aged 70 to 82 years old. Another study done by Codjo HL, Sonou A *et al* concluded that the prevalence of peripheral artery disease (PAD) among population of Cotonou (Black Africans) was high.

Prolonged standing at work has been shown to be associated with a number of potentially serious health outcomes, such as lower back and leg pain, cardiovascular problems, fatigue, discomfort, and pregnancy-related health outcomes.

Tomei *et al.*, 1999, investigated the relationship between major venous pathologies in the legs and prolonged standing. Clinical tests indicated that prolonged standing and age were related to increased risk of venous pathologies.

Low ankle blood pressures are known to be a measure of subclinical atherosclerosis and as such have been consistently related to subsequent cardiovascular morbidity and mortality.¹⁻⁷ In healthy individuals, ankle systolic blood pressures are slightly higher than the systolic blood pressure measured in the arm.

It may be hypothesized that in the legs, remodeling of vessel structure occurs, resulting from increased intraluminal pressure, characterized by increased wall thickening and unchanged inner radius. The changes in wall thickness resulting from increased hydrostatic pressure in the lower extremities with standing (vertical position) occur which eventually lead to atherosclerotic occlusion, hence lowering the ankle pressures.

CONCLUSION:

It can be concluded that standing for long period has a considerable impact on lower limb blood circulation, and intervention can be made to prevent the circumstances.

Limitations

Small sample size.
Covid-19 pandemic.

Conflicts Of Interest: None

Funding: There was no specific funding from any funding agency in the public, commercial or not-for-profit sections.

Acknowledgements:

The authors would like to thank all participants in the study.

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