



## A COMPREHENSIVE STUDY OF CLINICAL PROFILE, RISK FACTORS AND TREATMENT OUT COME OF PERIPHERAL ARTERIAL DISEASES OF LOWER EXTREMITIES

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**ABSTRACT** **Objectives:** To study the pattern of clinical presentation, aetiology, various investigations for diagnosis and management of Peripheral arterial occlusive disease. **Materials And Methods:** This is a cross-sectional study including 50 patients who presented to OPD at Government General Hospital, Anantapur, with Peripheral arterial occlusive disease. patients above the age of 18 years with symptoms of rest pain, claudication pain, ulceration and gangrene with evidence of lower limb arterial occlusive disease on doppler are included in this study. Patients less than 18 years of age and PAD of upper extremities, patients with history of trauma of lower extremities and pain due to musculoskeletal or neurological origin are excluded. **Statistical Analysis:** The results of the study are expressed in terms of proportion. **Results:** In this study the most common etiological factor contributing for Peripheral arterial occlusive disease is atherosclerosis (76%) followed by thromboangiitis obliterans (24%). This disease has male preponderance and the most common age group affected is 41 years and above. The most common mode of presentation is rest pain and 50% of patients presented with gangrene affecting foot and lower 1/3rd of leg. The most common co-morbid condition associated with Peripheral arterial occlusive disease in this study is diabetes mellitus. Tobacco smoking is the most common addiction associated with Peripheral arterial occlusive disease. 45% patients with atherosclerosis showed involvement of infra-popliteal site. Almost all patients required surgical intervention due to the late presentation at tertiary care center. 66% of patients in this study required amputation. None of the patient died following amputation in this study. The cardiac evaluation showed abnormality in almost 20% of the study group. This emphasises the need for cardiac evaluation in all cases of peripheral arterial disease and this condition is called atherosclerosis. **Conclusion:** peripheral arterial disease is due to atherosclerosis in most of cases with male preponderance after 41 years and above with gangrene as the most common clinical presentation. Prompt surgical intervention in the form of amputation, reduced mortality rate.

**KEYWORDS :** Peripheral Arterial Disease, Atherosclerosis, Diabetes Mellitus, Amputation

### INTRODUCTION

Peripheral arterial disease is a condition that occurs due to the deposition of excessive fat and cholesterol that results in restricted blood flow. PAD is correlated with cardiovascular disease by development of fatty acid deposition on arterial walls known as atheroma and this condition is known as atherosclerosis. The risk factors are high blood pressure, diabetes and smoking. Individuals prone to PAD should implement preventive measures to prevent the severity of PAD. The arterial system of lower limb involves femoral artery, profunda femoral artery, popliteal artery and so on. The diagnosis of PAD involves USG, Doppler scan, CT angiogram, MR angiogram. The imaging methods detect the blood clot in the vessels. Prolonged period of avoidance and no treatment leads to stroke, heart attacks, and extreme conditions leading to amputation. The risk is enhanced in patients with smoking as tobacco worsens symptoms by increasing catecholamines leading to increased heart rate and blood pressure which accelerate the process of atherosclerosis.

### AIMS AND OBJECTIVES

To study the pattern of clinical presentation, aetiology, various investigations for diagnosis and management of Peripheral arterial occlusive disease.

### MATERIALS AND METHODS

This is a cross-sectional study including 50 patients presented to OPD at Government General Hospital, Anantapur, with Peripheral arterial occlusive disease.

### Inclusion Criteria:

patients above the age of 18 years with symptoms of rest pain, claudication pain, ulceration and gangrene with evidence of disease on doppler are included in this study.

### Exclusion Criteria:

Patients less than 18 years of age and PAD of upper extremities, patients with history of trauma of lower extremities and pain due to musculoskeletal or neurological origin are excluded.

### Ethical Considerations

- Present study is cross sectional observational study
- No experimental animals are involved in the study

- No financial burden will be made on the study objects and the hospital.

### Data Analysis

Proportions are calculated using MS Excel sheet.

### RESULTS

Atherosclerosis and thromboangiitis obliterans are the two etiologies encountered in this study. Atherosclerosis is seen in 76% of cases and Thromboangiitis obliterans is seen in 24% of cases. There is male preponderance in both etiologies and there were 34 males and 4 females in atherosclerosis group. 11 males and 1 female in TAO group. Atherosclerotic disease is distributed along age groups of 41 to 60 years and above 60 years. TAO is seen mostly in younger individuals aged below 40 years. Gangrenous presentation was the most common type of presentation. 79% of atherosclerotic patients presented with pain at rest, intermittent claudication and gangrene, whereas the rest 21% presented with pain at rest, intermittent claudication and ulceration. Among the TAO cases gangrenous presentation was common accounting to 67% of the cases. 4 cases (33%) presented with pain at rest, intermittent claudication and ulceration. Gangrene of only toes was observed in 21% atherosclerotic cases. 50% of atherosclerotic cases involved the foot. Only 8% cases depicted involvement of leg in the gangrenous presentation. In 50% of the TAO cases the gangrene was limited to the toes only. No involvement of thigh was observed in both the etiologies. In the Atherosclerotic group, 26% were hypertensive, almost 50% were diabetic, 26% suffered from cardiovascular diseases, 21% were dyslipidemia patients and 3% suffered from thyroid disorders. In the TAO group, 16% were hypertensive and 8% were hypothyroid. Tobacco smoking was the most common addiction. 63% in the Atherosclerotic group and 83% in the TAO group were tobacco smokers. Tobacco chewing was observed in 16% of atherosclerotic group and 14% of the TAO group. 75% of the TAO group were alcoholics whereas 24% of the Atherosclerosis group were alcoholics. In Doppler Atherosclerosis involved proximal arteries whereas ThromboAngitis Obliterans involved distal arteries mainly. All the fifty patients were started on medical therapy for Peripheral Artery Disease. Later, all the fifty patients had to be shifted to surgical mode of management due failure of medical therapy. 8% of the patients underwent Lumbar Sympathectomy. 10% of the patients underwent disarticulations. 16% of patients underwent both Lumbar

Sympathectomy and disarticulations. 66% of patients underwent amputations. 37% of patients with atherosclerosis recovered, 10% had to undergo amputation and 53% underwent secondary suturing. 50% of patients with TAO had uneventful recovery, 17% had to undergo amputation and 33% needed secondary suturing. No patient died in both the etiological groups.

## DISCUSSION

The results of this study shows that the prevalence of “Peripheral Artery Disease ” among male patients is high. However this work shows many differences in terms of age and gender. In this research, classifications of patients have been made on the basis of two diseases: Atherosclerosis and TAO. According to the results, 76% of patients have Atherosclerosis and approximately 12 (24%) out of 50 have TAO. This indicates most people in the survey possessed risk factors like high blood pressure and cholesterol. patients with TAO are addicted to cigarette smoking. Similar findings were obtained in the study by Schramm K et al.[1]. The current study has found that males are the dominant group. Similar results noticed in the studies by Anand SS et al, Arya S et al, and Bauersachs R et al [2],[3],[4]. However the results obtained from Schramm K et al has shown female preponderance [1].

In this study patients having Atherosclerosis have clinical features like Nocturnal pain, “coldness of affected limb”, “Ulceration along with Intermittent Claudication and Pain at Rest”, and/or “Gangrenous Presentation with Intermittent Claudication and Pain at Rest”. These features vary from patient to patient depending on the cause and severity of the disease [5].

In this study, most people are found to have gangrene up to the foot, while 8% of people have gangrene on their toes. The condition is found to extend till toes in 50% of cases while it is rare upto thigh[5]. The study is criticised by the study of Freisinger showing it is extendable to toes for 20-35% patients while 90% till thigh. Approximately 50% of people in Al Wahbi research are found to have gangrene in toes only, whereas the current research found 37% of people. The work of Quiroz shows 30%, while Freisinger has found 20 to 35% of people having gangrene upto toes. Therefore, required medications are given immediately to avoid amputation. Treatments like administering antibiotics, surgery, or oxygen therapy are provided to patients according to severity of PAD.

The comorbidities in the study include Diabetes, Hypertension, Cardiovascular diseases, Thyroid Disorders and Dyslipidemia. Other studies have also indicated similar comorbidities [2]. The study has also noted different results based on Gender and Etiological aspects. Hypertension, CVDs, diabetes, Dyslipidemia and thyroid disorders are the major comorbidities identified. . The study of Shameer indicated 71% cases shows hypertension while 76% of patients show Dyslipidemia. . This study has analysed diabetes as most common comorbidity.. In this study, 38% of people have diabetes, 28.24% of people in Shameer's research, and 95% in Mikus's research the most significant comorbidity is Hypertension. 26% of the participants with Atherosclerosis have Hypertension whereas another 16% suffer from this condition. The next critical comorbidity is Dyslipidemia as this condition afflicted 21% of the patients with Atherosclerosis[6]. On the contrary, this condition was not noted among TAO patients. Thyroid disorders are also noted among male patients[3]. The final Comorbidity is Thyroid Disorders with 3% of Atherosclerosis patients and 2% of TAO patients.

The study showed tobacco and alcoholism to be the major addictions linked with TAO and Atherosclerosis. The usage of tobacco has been categorised into smoking and chewing. It has been noted that the effect of addiction is more prominently noted among men[1]. In this study, 52% of the patients with Atherosclerosis have an addiction to smoking. 12% of Atherosclerosis patients have an addiction to chewing tobacco. Alcoholism is seen in TAO and Atherosclerosis patients with 27% and 24% patients respectively. The work of Fu claims Nicotine is highly responsible for the disease, while smoking is considered reason for the disease in Prasad's research. Mousavi-Mirzaei has found smokers aged above 65 years are the most dominant group.

Another important aspect of the study is localisation of obstruction site among TAO and Atherosclerosis patients[4]. Four sites of obstruction were noted as Superficial Femoral, popliteal, infra popliteal, ankle regions. The analysis has shown that 3% of Atherosclerosis patients and 25% of the TAO patients have obstruction at ankle. Wolf study

showed 41% cases with high strain therapy in association with PAD. The analysis has also shown the Infra-popliteal localisation of obstruction sites is common among 32% of Atherosclerosis patients and 67% of TAO patients. Popliteal site of obstruction was noted among 45% of Atherosclerosis patients and 8% of TAO patients. In current study, the Superficial Femoral region is noted as the obstruction site among 16% of Atherosclerosis patients. Mousavi-Mirzaei and Dittman have affirmed that Superficial Femoral is found in older patients. However, according to Wolf work, 41% with “high strain therapy are found to have Superficial Femoral.

From the responses collected in the survey regarding the management 50 of them are given medical management and all were shifted to surgical management after a failure of medical therapy. In Saratzis' work, people aged 45 to 80 years are shifted to medical management, while people above 60 years of age were shifted to surgical management. 63% non smokers in Halle's work were shifted to medical management, while 59% who had smoking history were shifted to surgical requirements This signifies that the medical management techniques are not that developed to handle PAD. Medical management and shift to surgical management are part of PAD treatment . The study is supported by findings of Halle and Saratzis, who indicated the requirements are more than 50%. It is important to give patients treatment like anti coagulation, antiplatelet therapy, peripheral vasodilators, cholesterol reduction, exercise therapy, blood pressure control, and smoking cessation. To reduce mortality and complications of PAD. .

In this study 8% of the patients (4) have experienced “Only Lumbar Sympathectomy”. On the other hand, 10% of the patients (5) underwent “Only Disarticulations” and 16% of the participants underwent “Lumbar Sympathectomy and Disarticulation”. Galani's work shows that 18 people had only lumbar sympathectomy[7], whereas only 2 patients in surrender study[8]. study of Hartimath showed 16% Lumbar Sympathectomy and 12% Only Disarticulations, indicating the most preferred management styles[9]. People who are in the higher stage of PAD undergo Amputation making it one of the most efficient techniques in PAD management.

In this survey patients with Atherosclerosis and TAO have different outcomes like Recovery – Relieved Of Symptoms, Need For Re-Amputation, Secondary Suturing, Mortality”. The analysis has shown Recovery – Relieved of Symptoms” among 37% of Atherosclerosis patients and 50% of TAO patients. This signifies the recovery from TAO and atherosclerosis. Re-Amputation among 10% of Atherosclerosis patients and 17 % of TAO patients. Secondary Suturing among 20 % of Atherosclerosis patients and 30 % of TAO patients. Mortality among 0% of Atherosclerosis and TAO patients. Thus, it can be said that the use of “Recovery – Relieved Of Symptoms and Secondary Suturing” are the most efficient method of surgery in this case. The age limits are the major factors. The recovery symptoms for people below 40 years is 40%. 12% of amputations are associated with patients of age group 40 to 50 years. On the other hand, Dittman has suggested First line therapy, while Saratzis has suggested people below 40 years for the treatment. Anghel has suggested treatment plans for patients with smoking backgrounds. Secondary Suturing and Recovery have been identified as the two most common surgical outcomes for PAD patients.

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