

Clinical Profile of Peripheral Arterial Occlusive Diseases of Lower Extremities

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ABSTRACT

Back ground :

Peripheral arterial disease(PAD) comprises those entities which result in obstruction to blood flow in the arteries, exclusive of the coronary and intracranial vessels and the term is usually applied to disease involving the arteries of lower extremity.

Aim of this study is to know the various etiologies, the pattern of clinical presentation, to know the extent of various investigations that are effective in diagnosis and also the extent of management, whether conservative or surgical is

effective in peripheral arterial diseases in surgical wards of Guwahati medical college and hospital.

Materials and methods :

cross sectional observational study of 50 cases diagnosed with (PAD) of the lower extremities, done during the period from 1st June 2020 to 31st May of 2021 in patients admitted to surgical wards of GMCH, Guwahati. It consisted of taking a good clinical history, a thorough clinical examination, essential laboratory investigations, looking for the presence of atherosclerotic risk factors and further evaluated objectively by Doppler scanning followed by the treatment of each patient was individualized with the aim to achieve foot salvage .

Results :

Total number of patients in the present study were 50 (n=50). Among that the incidence of Atherosclerosis, TAO were respectively 72%, 28% with high male preponderance. Distribution of age observed in Atherosclerosis was >50 years, and in TAO it was <50 years. Majority of the

Patients presented with gangrenous changes. The incidence of gangrene is almost equal in both the groups. TAO was usually limited to the distal part of the limb, whereas atherosclerosis was seen extending proximally. 3% cases due to atherosclerosis had gangrene extending upto the leg. DM was the commonest associated disease among the atherosclerosis group, while TAO was with no associated disease but with 100% association with tobacco smoking. Majority of the patients underwent amputation of affected limb with or without LS. Improvement of rest pain noted in 62.5% of cases, healing of ulcer in 50% of cases and improvement in claudication pain in 37.5% of patients who underwent lumbar sympathectomy.

Conclusion :

In PAD, early presentation to the hospital can lead to early diagnosis and treatment for PAD which can lead to better prognosis by non surgical interventions.

Key words :

Peripheral Arterial diseases, Thromboangitis obliterans (TAO), Diabetes Mellitus(DM).

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I. Introduction :

Peripheral arterial disease is an important manifestation of atherosclerosis involving the arteries of legs.¹ The symptoms of lower extremity arterial occlusive disease are classified into two large categories: Acute Limb Ischemia (ALI) and chronic limb ischemia. 90% of acute ischemias are either thrombotic or embolic. Chronic ischemia is largely due to atherosclerotic changes that manifest from asymptomatic to limb-threatening gangrene.² Vascular disease is a leading cause of morbidity and mortality in people with diabetes. Diabetic foot problems are due to combination of ischemia and neuropathy often complicated by infection.³ Intermittent claudication, heralded by pain in leg muscles during ambulation is the earliest and the most classic symptom among patients with Peripheral arterial disease.⁴ As in atherosclerosis Various non-atherosclerotic conditions like Thromboangitis obliterans, Takayasu's disease, arterial fibrodysplasia, peripheral

emboli, primary vascular tumors, remotrauma or radiation injury also can cause symptoms consistent with intermittent claudication. Currently the appropriate management of patients with chronic lower limb ischemia is a complex clinical issue. Despite the advance in technical issues of revascularization, there remains much that can be done regarding education, risk factor modification and non-operative therapy for these patients. PAD is debilitating, persons with PAD have substantial functional impairment and increased rates of functional decline compared with their counterparts without PAD. Diagnosing PAD is important in order to implement appropriate therapies for preventing cardiovascular morbidity and mortality, improving functional impairment, and preventing further functional decline.

II. Materials And Methods:

This study was conducted by random selection of 50 cases with Peripheral Arterial disease of the lower extremities admitted to surgical wards of Guwahati medical college and Hospital, Guwahati. This was a cross sectional observational study of 50 cases diagnosed with PAD done during the period from 1st June 2020 to 31st May of 2021. Study was carried out after clearance from Institutional Ethics Committee and after taking informed consent from the patients.

The study consisted of taking a good clinical history, evaluating for presence of atherosclerotic risk factors, a thorough clinical examination and the degree of vascular inadequacy and extent of the spread of the disease was assessed clinically by noting the colour change, extent and spread of gangrene and absence of peripheral pulses in the affected limbs, essential laboratory investigations with further evaluated objectively by Doppler scanning whenever feasible to assess the level and degree of obstruction objectively followed by the treatment of each patient was individualized with the aim to achieve foot salvage .

Inclusion criteria

- Patients presenting with signs and symptoms of Peripheral Arterial disease of the lower extremities like intermittent claudication, rest pain, ulceration and gangrene.
- Patients with evidence of lower limb arterial occlusive disease on Doppler study.

Exclusion criteria

- Patients with Peripheral Arterial disease of regions other than the lower extremities.
- Patients with history of trauma to the lower extremities were excluded.
- Patients presenting with pain of skeletal or neurologic origin of lower limbs with no evidence of vascular damage.
- Patients presenting with ulcers of traumatic or infective origin with no evidence of Ischemia.

These cases were analyzed in detail with reference to age, sex incidence, and duration of clinical presentation, clinical manifestations with associated diseases, habits & various investigations they underwent during the period of hospital stay followed by the management of the patients which is by conservative & surgical interventions and Follow up.

Result : The results and observations of this study are described as follows.

1. Sex distribution :

SEX	ATHEROSCLEROSIS	TAO
Male	33	14
Female	3	0
Total	36 (72%)	14(28%)

All TAO cases were males and in the atherosclerosis group there were three females. The diagnosis was done based on history , examination and relevant investigations.

2. Age distribution :

AGE in group (years)	Atherosclerosis	TAO
21-30	0	2(14%)
31-40	0	8(57%)
41-50	4(11%)	4(29%)
51-60	14(39%)	0

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>61	18(50%)	0
TOTAL	36(72%)	14(28%)

Majority of the cases in atherosclerosis were above the age of 50 years, while in the TAO group majority belong to the age group between 31 to 50 years.

3. Clinical presentation of patients :

SYMPTOMS	ATHEROSCLEROSIS	TAO
Intermittent claudication (IC) only	0	0
IC+ Rest pain	0	0
IC + Rest pain + Gangrene	29(81%)	11(79%)
IC + Rest pain + Ulcer	7(19%)	3(21%)
TOTAL	36(72%)	14(28%)

Majority of the Patients presented with gangrenous changes. The incidence of gangrene is almost equal in both the groups. All patients had dry gangrene. Ischemic ulceration was present in ten patients.

4. Extent of gangrenous changes :

Site	Atherosclerosis	TAO
Toes only	12(33%)	12(86%)
Toes and Foot	21(59%)	2(14%)
Toes, foot , leg	3(8%)	0
Upto thigh	0	0
Total	36(72%)	14(28%)

TAO was usually limited to the distal part of the limb, whereas atherosclerosis was seen extending proximally. Three cases due to atherosclerosis had gangrene extending upto the leg. No cases had gangrene extending to the thigh.

5. Associated diseases :

Associated diseases	Atherosclerosis	TAO
Diabetes Mellitus(DM)	19(53%)	0
Hypertension	9(25%)	0
Ischemic Heart Disease	6(17%)	0
Hypercholesterolemia	2(5%)	0

DM was the commonest associated disease among the atherosclerosis group, other conditions being hypertension and ischemic heart disease. In the atherosclerosis group, 6 cases had DM along with hypertension. In our study 2 patients had hypercholesterolemia and were also diabetic.

6. Habits associated in patients with PAD:

Habits	Atherosclerosis	TAO
Beedi smoking	14(39%)	12(86%)
Cigarette smoking	8(22%)	2(14%)
Alcoholism	6(17%)	8(57%)
Tobacco chewing	4(11%)	2(14%)
None	8(22%)	0

All patients with TAO had a history of smoking and 61% of atherosclerotic patients gave history of smoking. Beedi smoking being the most common form of addiction. In the atherosclerosis group, eight patients had no history of any addiction to smoking or alcohol.

7. Doppler findings in the affected limbs :

Site of obstruction	Atherosclerosis	TAO
Ankle	0	4(29%)
Infra-popliteal	13(36%)	10(71%)
Popliteal	18(50%)	0
Superficial femoral	5(14%)	0
Total	36(72%)	14(28%)

Majority of the patients had popliteal disease in the atherosclerosis group, with TAO affecting more distal vessels and atherosclerosis involving the more proximal arteries.

8. Modalities of treatment adopted :

Modalities of treatment	Number of patients
Medical / conservative	50
Lumbar Sympathectomy (LS) ONLY	2
Amputations	36
Disarticulation and LS	6
Disarticulation only	6

All the patients in this study were initially started on medical treatment, and eventually underwent different modalities of surgical management . Majority of the patients in this study underwent amputation of affected limb. The level of amputation was below knee in 42% and above knee in 58% cases. Lumbar sympathectomy was done in 8 cases, and among these cases disarticulation was done in 6 cases. 12% of the patients underwent disarticulation of the involved toes.

9. Results of Lumbar sympathectomy :

Signs and symptoms	No. of patients	Relieved		Not Relieved	
		No.	%	No.	%
Rest pain	8	5	62.5	3	37.5
Ulcer	2	1	50	1	50

The result of lumbar sympathectomy in terms of improvement in symptoms. Improvement of rest pain noted in 62.5% of cases, healing of ulcer in 50% of cases and improvement in claudication pain in 37.5% of patients who underwent lumbar sympathectomy.

10. Post operative recovery :

Post operative events	Atherosclerosis	TAO
Uneventful recovery	16 (44%)	8 (57%)
Revision Amputation	2 (6%)	1 (7%)
Secondary suturing	18 (50%)	5 (36%)
Death	0	0
Total	36 (72%)	14 (28%)

Majority of the patients had an uneventful recovery, with complication rates being higher among atherosclerosis group. In atherosclerosis group, 50% required secondary suturing of the surgical wound and two cases underwent revision amputation.

III. Discussion :

In the present series of 50 cases of PAD of the lower extremities, all the cases in the present study fall under the category of chronic lower limb ischemia. Here, 36 (72%) cases were due to Atherosclerosis and 14 (28%) were due to ThromboAngitis Obliterans. Khanna SK (1978) reported that TAO is the commonest type of PAD in India. Mills JL and Porter JM et al (1985) & Selvin E and Erlinger TP et al (1999 – 2000) reported in their study that the incidence of TAO in females was found to on the rise in the western population due to the increasing prevalence of smoking in females. 6,7 The study done by Nigam R., (1980) reported that 56% of the atherosclerosis cases belonged to the age group 60-70 yrs, oldest being 78 yrs. 8 The age distribution pattern is similar in my study, with 50% of the atherosclerosis cases were in the age group of above 60 years. Also in his study that 88% of the TAO cases were aged between 31-50 yrs, similar to the findings in our study. 8 In Sex Distribution, Selvin E and Erlinger TP (1999 – 2000) on the prevalence of and risk factors for peripheral arterial disease in the United States, it was found that although there was a slightly higher prevalence in men than in women, the prevalence dramatically increased with age, rising from 0.9% in those younger than 50 years to 14.5% in those 70 years or older. 9 In age distribution Atherosclerosis was commonly seen among the age group of above 60 years (50%) in my study and 89% cases were over the age of 50 yrs. 11% cases were seen in the age group of 41-50 yrs. In clinical presentation, the same presentation was depicted in studies of Nigam R (1980) 10, Sasaki S et al (2000). 11 History of smoking was present in 61% patients in the atherosclerosis group and in 100% of the patients in the TAO group. The patients in the TAO group were chronic smokers with history of smoking beedi or cigarette for 10 yrs or more, with 86% of the cases smoking beedis. Same result was noted in Price JF et al (1999) 12, Criqui MH et al (1997). 13 In the present study Diabetes mellitus (DM) was present in 53% of the cases, Hypertension was seen in 25% of the cases also hypercholesterolemia was seen with atherosclerosis and none of the patients with TAO had DM.

IV. Conclusion :

TAO and Atherosclerosis are the etiologies for ischemia in these cases, with Atherosclerosis being more common of the two. TAO presented at a younger age group whereas atherosclerosis presented in the older age group. All the cases of PAD presented with ischemic claudication and rest pain as common symptoms, while gangrene and ischemic ulcer were the other predominant symptoms that presented to hospital. Atherosclerosis is more frequently associated with Diabetes mellitus, while TAO is exclusively associated with cigarette smoking. Doppler findings correlated with the disease presentation, TAO having a more infra-popliteal obstruction and atherosclerosis showing more proximal obstruction. Medical management consisted of analgesics, antibiotics, cessation of smoking which found to be playing important role in improvement of symptoms and prognosis of TAO, anti-diabetic and anti-hypertensive and also anticholesterol drugs. Most of the cases were managed with some form of surgery and majority of them had limb loss. Improvement of rest pain, healing of ulcer and improvement in claudication pain noted in patients who underwent lumbar sympathectomy. So, early presentation to the hospital can lead to early diagnosis and treatment for PAD which can lead to better prognosis by non surgical interventions.

Reference:

- [1]. Hiatt WR. Medical treatment of peripheral arterial disease and claudication. *N Eng J Med* 2001;344:1608-21.
- [2]. Ouriel K. Detection of Peripheral arterial disease in primary care. *JAMA* 2001 Sep; 286:1380-1.
- [3]. Jaap AJ, Tooke JE. Diabetic angiopathy and Diabetic foot. Chapter 17. In: Tooke JE, Lowe GDO, editors. *A textbook of vascular medicine*. London: Arnold; 1996. p 254-71.
- [4]. Criqui MH, Denenberg JO, Bird CE, Fronck A, Klauber MR, Langer RD. The correlation between symptoms and non-invasive test results in patients referred for Peripheral Arterial Disease testing. *Vasc Med* 1996;65-71.
- [5]. Khanna SK. ThromboAngitis Obliterans. *Ind J Surg*. 1978;40:169.
- [6]. Mills JL, Porter JM. Buerger's Disease: A review and update. *Semin Vasc Surg* 1993;6:14-23.
- [7]. Selvin E, Erlinger TP: Prevalence of and risk factors for peripheral arterial disease in the United States: Results from the National Health and Nutrition Examination Survey 1999-2000. *Circulation* 2004;110:738-43.
- [8]. Nigam R. The clinical profile of TAO and Arteriosclerosis obliterans. *Ind J Surg* 1980;42:225.
- [9]. Selvin E, Erlinger TP: Prevalence of and risk factors for peripheral arterial disease in the United States: Results from the National Health and Nutrition Examination Survey 1999-2000. *Circulation* 2004;110:738-43.
- [10]. Nigam R. The clinical profile of TAO and Arteriosclerosis obliterans. *Ind J Surg* 1980;42:225.
- [11]. Sasaki S, Sakuma M, Kunihara T, Yasuda K: Distribution of arterial involvement in thromboangiitis obliterans (Buerger's disease): Results of a study conducted by the Intractable Vasculitis Syndromes Research Group in Japan. *Surg Today* 2000;30:600-5.
- [12]. Price JF, Mowbray PI, Lee AJ. Relationship between smoking and cardiovascular risk factors in the development of peripheral arterial disease and coronary artery disease: Edinburgh Artery Study. *Eur Heart J* 1999;20:344-53.
- [13]. Criqui MH, Denenberg JO, Langer RD. The epidemiology of peripheral arterial disease: importance of identifying the population at risk. *Vasc Med* 1997;2:221-6.