**International Academy of Science,
Engineering and Technology**
Connecting Researchers; Nurturing Innovations
**IASET**

# CLINICAL AND ANGIOGRAPHIC PROFILE OF PATIENTS WITH SYMPTOMATICPERIPHERAL ARTERIAL DISEASE

*Kishan Aralapuram[1] & Shilpa Jayaprakash[2]*

*[1]Assistant Professor, Institute of Nephrourology, Victoria Hospital Campus, Bengaluru, Karnataka, India*

*[2]Assistant Professor, Department of Cardiology, Sri Jayadeva Institute of Cardiovascular Sciences and Research,*

*Bangalore, Karnataka, India*

## ABSTRACT

*Peripheral arterial disease (PAD) with risk of major cardiovascular(CVD) events at global level, because it has been associated with frequently coronary and cerebral atherosclerosis. A considerable proportion of patients with CAD have associated PAD, Since many are asymptomatic condition, and remains under diagnosed in exposed population. Some intervention known about the incidence and clinical relay on PAD of known population. In this proximity, the present research paper aims to correlate the clinical and Angiographic profile of patients with peripheral arterial disease who underwent revascularization. The retrospective observational study was conducted at tertiary care referral hospital in Bengaluru city. A total 51 cases with peripheral arterial disease who were symptomatic and planned for revascularization, all cases were admitted in the hospital from January 2014 to December 2014,the subjects or cases were selected based on the standard operating procedure (SOP). As per the resulted findings, the mean age of the study population was 56+/-11 years. Age group between 61–70 years (31%) with mean age was 68.55 years, the males comprises 49(96%) females was 02(4%) cases respectively. All patients were symptomatic stage and found to be statistically differ (p < 0.01).The peripheral angiogram was done at greatest precision to define the anatomy of the interest, the results found to be significantly correlated (p < 0.01) with age group of the cases. An involvement of right superficial femoral artery (SFA) was seen in 17(33.33%) cases, right common iliac artery (CIA) was seen in 11 (21.5%) subjects, left SFA and and left CIA was seen in 9(17.6%) cases each, the right femoral artery was associated in 8 (15.6%) cases, an involvement of aorta presented 5 (9.8%) cases, left anterior tibial artery is presented with 4 (7.8%) subjects, the right and left popliteal arteries and right anterior tibial artery was arbitrary affected 3 (5.8%) cases each and left femoral artery, right and left posterior tibial arteries were associated 2 (3.9%) cases each. The summing of the results concludes that, the PAD remains a major healath care risk, it remains under-diagnosed on pragmatic basis in developing countries. Hypertension, smoking and diabetes is a major underlying risk factors to correlate early diagnosis, which may lead to be more associated with risk factors to increase the incidence and a hazard risk of PAD.*

**KEYWORDS:** *PAD-Peripheral Arterial Disease, Risk Factors, CAD, Subjects, Vessel Disease (VD)*

## INTRODUCTION

Peripheral arterial disease (PAD) correlates strongly with risk of major cardiovascular(CVD) events because it has been associated frequently with coronary and cerebral atherosclerosis[1–4]. Coronary artery disease is the leading cause of death

in this subset of patients [5]. High suspicion of CAD and early detection is necessary for them. The management of patients with both coronary and peripheral vascular disease is very difficult task and raises many controversial issues[5]. Many questions are probe with respect to prevalence of coronary artery disease as compared with general population or in patients with occlusive vascular disease. Since, these important questions are not yet available and in the absence of definitive randomized trials of different management strategies, decisions must be based on extrapolation from life data sets compiled primarily from individual reported series [7]. Recent advances have been extend the surgical correction of both coronary and peripheral vascular disease in aging population. Thus, an issues shows great importance has been given for aged population [10]. Although, an old age itself should not be considered synonymous with coronary artery disease, the incidence of the latter increases strikingly in the elderly [7]. Inevitably, we will be faced with a rapid expansion of a population in which the combination of advanced age and diffuse atherosclerosis will limit the potential for coronary or peripheral revascularization to alter long term survival significantly. Paradoxically, the development of newer imaging techniques has enabled the earlier recognition and treatment of peripheral vascular disease in younger patients [10, 11, 12, 13 ]. It is in this younger subgroup that the impact of coronary artery disease on late outcome is increasing in importance, as is the potential for coronary revascularization to improve outcome. There is paucity of literature in the Indian context with respect PAD, The present study aims to correlate the clinical and Angiographic profile of patients with peripheral arterial disease who underwent revascularization.

## METHODS

The retrospective observational study was conducted at tertiary care referral hospital in Bengaluru city. A total 51 cases with peripheral arterial disease who were symptomatic and planned for revascularization,cases were admitted in the hospital from January 2014 to December 2014,the subjects or cases were selected based on the standard operating procedure (SOP). The coronary angiogram was done, those subjects who were associated symptomatic with angina or prior MI, the patients who are had additional risk factors like smoking, diabetes mellitus or hypertension*etc* was considered for the study.The data sets was collected from inpatient admission records,the detailed history of the patient was extracted from the case reports,the physical examination was done for all the patients. Coronary and peripheral angiogram was reviewed systematically with greater precision and accuracy,either CT peripheral angiogram or conventional peripheral angiogram was done during the study period. Coronary lesion was considered significant if LMCA had stenosis of >50.0%, other vessels had stenosis of >70%. Further, the peripheral angiogram lesion was considered significant if lesion was >70%,patients were categorized into single vessel based on the subjective and objective approach, double or triple vessel disease was categorized based on the number of vessels would be involved. Peripheral angiogram was described briefly in accordance with vessel affected and its extent.Collected data was analysed by SPSS-16.50 version statistical software, the multivariate logistic regression analysis was employed to draw the hypothetical (null hypothesis) results at greater precision and accuracy.

## RESULTS

Total 51 cases were included in the present study. The mean age of the study population was 56+/-11 years. The age group between 61–70 years (31%), age class distribution was shown in (figure 1).The males comprises 49(96%), 02(4%) were females respectively.All patients were symptomatic stage. Based on the fontaine classification, the cases were divided into different classes. Only six patients were presented Class IIA (11.7%), 19 cases were presented in Class IIB (37.2%), 16 subjects were found in Class III (31.3%) and 10 cases were *s*een in Class IV (19%) presented in (figure.2)
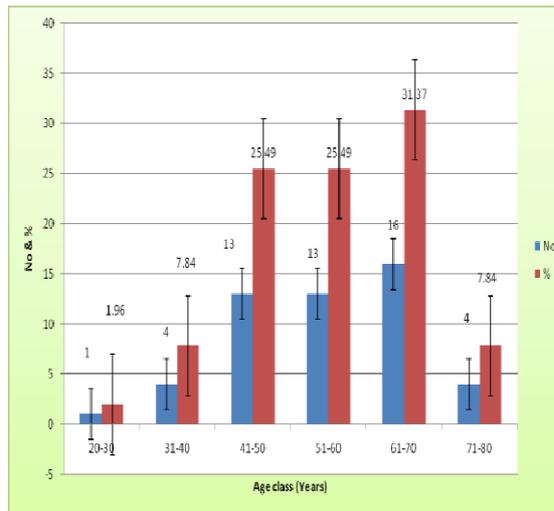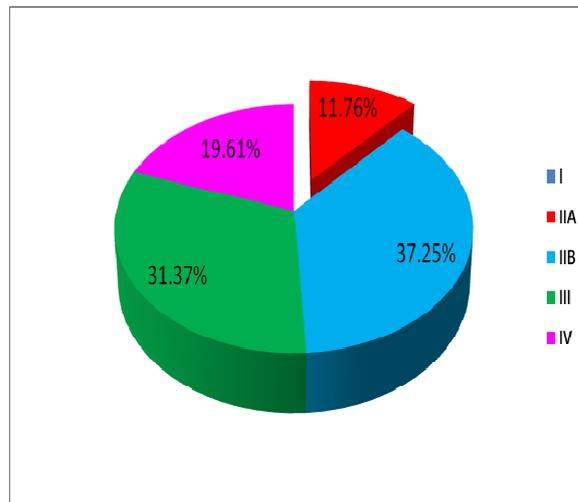


**Figure 1: Age Wise Distribution of Patients.**



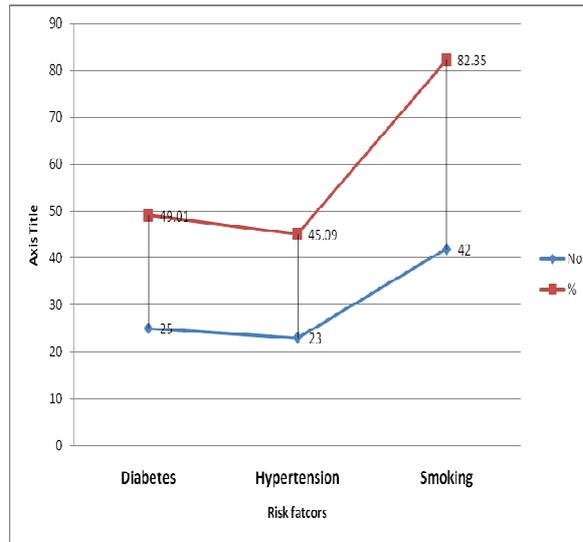**Figure 2: Describes Fontaine Class Distribution.**
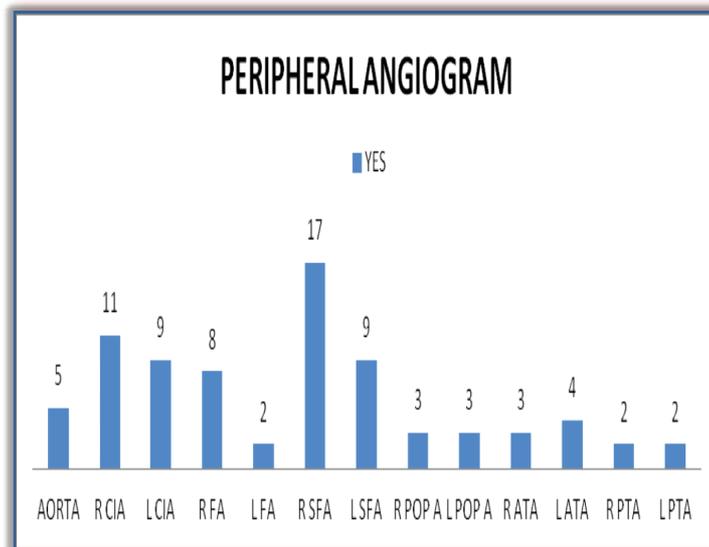
**Figure 3: Associated Risk Factors.**



**Figure 4: Peripheral Angiogram.**

The risk factors were recorded during the study period, out of which 25(49%) cases had diabetes mellitus, 23(45%) hypertension and 42(82.3%) were smokers at present or in recent past. The peripheral angiogram was done for all patients to define the anatomy and it was significantly correlated (p<0.01) with age group of the cases. An involvement of right superficial femoral artery (SFA) was seen in 17(33.33%), right common iliac artery (CIA) was seen in 11(21.5%), left SFA and and left CIA was seen in 9(17.6%) each, the right femoral artery was associated in 8(15.6%) cases, an involvement of aorta presented 5(9.8%) cases, left anterior tibial artery is presented 4(7.8%) subjects, the right and left popliteal arteries and right anterior tibial artery was arbitrary affected 3(5.8%) cases each and left femoral artery, right and left posterior tibial arteries were associated 2(3.9%) cases each. The percutaneous transluminal angioplasty was done 37(72.5%) cases and surgery was done 30(60.0%) cases. The history of angina on exertion was seen 6(11.7%) cases and history of myocardial infarction was found in 8(15.6%) cases and it was statistically significant difference was found (p<0.01). The mean LV ejection fraction was (53%) (p < 0.01). LV ejection fraction was adequate (EF>52%) 29 (56.86%) cases(p<0.01), mild LV dysfunction (EF-41–51%) was found in 16 (31.37%) cases

(p<0.01), moderate LV dysfunction (EF-31–40%) was found in 6 (11.7%) subjects it found to be non significant (p>0.01), the severe LV dysfunction (EF<30%) has not been noticed during the study period. The coronary angiogram intervention was done, it was revealed that,the LMCA involvement found in single subject which was found to be statistically insignificant (p>0.01). LAD involvement was presented on 16 subjects which was found to be statistically insignificant (p>0.01) and also significant LAD lesions were being correlated in 9 cases (p<0.01. The LCX significantly related (p<0.01) with lesions and it was associated in 9 subjects and it was correlated insignificant lesions(p>0.01) 10 cases. RCA had found to be significant lesion (p<0.01) and it was found in 8 cases and insignificant lesions was found in 9 cases. The coronary angiogram was found to be normal in 22 (43.1%) cases (p<0.01) and 16(31%) cases had found to be insignificant CAD (p>0.01). The single vessel disease was presented 5(9.8%); double vessel disease 3(5.8%) and triple vessel disease 5(9.8%) cases respectively, the vessel disease were strongly associated with risk factors and stenosis (p<0.01). A significant coronary artery disease was explained 13 (25.4%) cases, only 6 cases have undergone PTCA intervention, single patient has underwent CABG and 3 cases had undergone amputation respectively. Post operative follow up procedures is being correlated with respect to mortality, the present study has not been noticed, any mortality cases not been found during the study period. All patients with single and double vessel disease, as such case has been advised PTCA, medical management 3(5.8%) with TVD and 2(2.56%) subjects were advised CABG intervention.

**Table 1: Baseline Characteristics**

| Baseline Characteristics | Mean | P-Value |
|---|---|---|
| Age (Years) Male Female | 56 ± 6.3 48.11 ± 3.22 53.26 ± 1.89 | ≦ 0.0001 ≦ 0.0001 ≧ 0.0001 |
| Sex (Male/Female) | 49/ 2 (96.07%/3.92%) | ≦ 0.0001 |
| Fontaine Class I Class IIA Class IIB Class III Class IV | 6(11.76%) 19(37.25%) 16(31.37%) 10(19.60%) | ≧ 0.0001 ≦ 0.0001 ≦ 0.0001 |
| Type 2 Diabetes mellitus | 25(49.01%) | ≦ 0.0001 |
| Hypertension | 23(45.09%) | ≦ 0.0001 |
| Smoking | 42(82.35%) | ≦ 0.0001 |

**Table 2: Coronary and Peripheral Angiogram**

| Peripheral Angiogram | No (%) | P-Value |
|---|---|---|
| Aorta | 05(6.40%) | ≧ 0.0001 |
| Right CIA | 11(14.10%) | ≦ 0.0001 |
| Left CIA | 09(11.53%) | ≦ 0.0001 |
| Right femoral | 08(10.25%) | ≦ 0.0001 |
| Left femoral | 02(2.56%) | ≧ 0.0001 |

| Right superficial femoral | 17(21.79%) | ≦0.0001 |
|---|---|---|
| Left superficial femoral | 09(11.53%) | ≦0.0001 |
| Right popliteal | 03(3.84%) | ≦0.0001 |
| Left popliteal | 03(3.84%) | ≦0.0001 |
| Right anterior tibial | 03(3.84%) | ≦0.0001 |
| Left anterior tibial | 04(5.12%) | ≦0.0001 |
| Right posterior tibial | 02(2.56%) | ≦0.0001 |
| Left posterior tibial | 02(2.56%) | ≦0.0001 |

## DISCUSSIONS

This study was undertaken to evaluate the coronary artery disease among patients with peripheral arterial disease. CAD is the most commonest cause of death in exposed and known population. In this present study, the mean age of patient was 56+/-11 years. Total (31%) of the study group was bearing with older age group 61–70 years. This was apparently comparable another study done by (Hertzer et al)in hisstudy the mean age was 61yrs. Males were predominantly associated as compared with females (Hertzer et al).The risk factors were strongly associated and found to be statistically significant it was proved by logistic regression model 25 patients (49%) (odd ratio 3.1-5.62), relative risk (21.33%), diabetes mellitus 23 (45%) odd ratio (4.4-8.66) relative risk factor (32.85%) and hypertension 42 (82.3%) was significantly related to the occurance of the event odd ratio (5.11-11.52) relative risk (56.12) were smokers at present or in recent past [7–10]. Since,the present study smoking appears to be the escalate risk factor and found to be statistically significant (p<0.001) odd (15.56-20.11) relative risk factor was (62.33%). In a developing country like India, smoking is an important risk factor for atherosclerosis[5].In our study history of angina on exertion was seen only 6 cases (11.7%) and history of myocardial infarction significantly associated (p < 0.001). In a similar study done by (Hertzer et al) angina was seen in 19.8% and history of MI was seen in 22.1% which was found to be slightly higher when compared to the present study. LV ejection fraction was fully adequate (EF > 52%) which was found to significantly related to the present hypothesis cited in similar study reported by Hertzer *et al*(66%) had normal LV function. Single,double an d triple vessel disease was associated in many subjects and related to the incidence of CAD [7]. The anatomic pattern of atherosclerotic obstructive disease in the distal aorta and iliofemoral arteries varies with age group. In patients <40 years of age, aortoiliac disease is the most common site of atherosclerosis. In patients > 40 years, femoropopliteal disease accounts for more than 65% of anatomic sites that lead to claudication symptoms [5–6]. An approximately two-thirds of patients with iliac disease will have stenoses, whereas two-thirds of patients with femoral disease have occlusions, and most of these are characterized by long segmental occlusions [7]. Thus, successful long-term percutaneous revascularization of the femoral arterial segment is more challenging than iliac endovascular repair [10]. The risk factors for peripheral arterial disease are similar to those for coronary artery disease [11]. Diabetes and smoking connote a higher relative risk for PAD than CAD, whereas hypertension, family history of premature atherosclerotic disease, and hypercholesterolemia also serve as the major common risk factors [13].Progression to severe ischemia or amputation is unusual in patients with intermittent claudication, occurring in only approximately 1.4% of patients per year. The progression of disease and its complications is

markedly amplified in individuals with either a history of diabetes or current smoking[9–11].In the absence of these risk factors, the risk of limb loss in symptomatic patients is so low that no revascularization treatment could be considered "limb-sparing." Diabetes is a major predictor of outcome. Jonason and Ringqvist followed 224 nondiabetic patients and 47 diabetic patients over 6 years [10]. Gangrene occurred in 31% of the diabetic patients, but in only 5% of those without diabetes [9–12]. Diabetes has been associated with more than 50% of major amputations in patients with peripheral arterial disease. Long-term survival is reduced in patients with iliofemoral obstructive disease as compared with the normal population [10]. The risk of all-cause mortality in patients with large-vessel peripheral arterial disease compared with the normal population is increased approximately 3-fold, whereas the risk of cardiovascular death is increased 6-fold, but the most common cause of death in these patients is myocardial infarction or stroke [12].Peripheral interventions, either surgical or endovascular, have no impact on survival, but they can improve quality of life [7]. Thus, indications for peripheral intervention in the setting of iliofemoral obstructive disease are largely related to the presence of symptoms and the potential impact of the symptoms for the affected individual [3–5]. Progression of intermittent claudication to severe disabling symptoms, such as claudication after less than 200 meters, is a reason to consider surgical revascularization or angioplasty [1, 12, 13]. The presence of rest pain or ischemic ulceration is a more compelling indication for revascularization. The indications for bypass reconstruction of the femoral-popliteal and femoral-tibial segments are generally more stringent than those for aortofemoral reconstruction, and likewise the indications for angioplasty of vessels below the knee are more stringent than those for iliofemoral intervention[12]. It should be noted that preservation of inflow to the level of the profunda femoris is important for maintenance of collateral circulation to the infrapopliteal segment [9-12]. In patients who present with claudication, however, there should never be a presumption that any revascularization strategy can save limbs [13].

## CONCLUSIONS

The summing of the results concludes that, the PAD remains a major helath care risk, it remains under-diagnosed on pragmatic basis in developing countries.Hypertension, smoking and diabetes is a major underlying risk factors to correlate early diagnosis, which may lead to more associated risk factors to increase the incidence and a hazard risk of PAD.Concentrated more research efforts should be carried out on prospective basis further to determine the effect of various aspects of PAD including risk factors,clinical burden, treatment and outcomes at larger extent on scientific intervention.

## REFERENCES

1. *Evaluation and Management of Patients With Both Peripheral Vascular and Coronary Artery Disease; Bernard J. Gersh, JACC Vol. 18, No. I July 1991:203–14*

2. *U.S. Bureau of the Census. Statistical Abstract of the United States: 1989. lO9th ed. Washington, D.C.: U.S. Department of Commerce, 1989.*

3. *Elveback LR, Connolly DC, Kurland LT. Coronary heart disease in residents of Rochester, Minnesota. II. Mortality, incidence, and survivorship. Mayo Clin Proc 1981; 56:665–72.*

4. *Melton U, Bickerstaff LK, Hollier LH et al. Changing incidence of abdominal aortic aneurysms: a population-based study. Am J Epidemiol 1984; 120:379–86.*

5.  *Greenhalgh RM etal. Prognosis of abdominal aortic aneurysm. Br Med J1990; 301:136.*

6.  *Hertzer NR et al. Basic data concerning associated coronary disease in peripheral vascular patients. Ann Vasc Surg 1987; 1: 616-20.*

7.  *Hertzer NR, Beven EG, Young JR, et al. Coronary artery disease in peripheral vascular patients: a classification of 1000 coronary angiograms and results of surgical management. Ann Surg 1984; 199: 223–33.*

8.  *Krajewski LP, Olin JW. Atherosclerosis of the aorta and lower-extremity arteries. In: Young JR, Olin JW, Bartholomew JR, eds. Peripheral Vascular Diseases. St Louis, Mo: Mosby-Year Book, Inc; 1996: 208–233.*

9.  *Jonason T, Bergstrom R. Cessation of smoking in patients with intermittent claudication: effects on the risk of peripheral vascular complications, myocardial infarction and mortality. Acta Med Scand. 1987; 221: 253–260.*

10.  *Jonason T, Ringqvist I. Diabetes mellitus and intermittent claudication: relation between peripheral vascular complications and location of the occlusive atherosclerosis in the legs. Acta Med Scand. 1985; 218: 217–221.*

11.  *DeBakey ME, Glaeser DH. Patterns of atherosclerosis: effect of risk factors on recurrence and survival-analysis of 11,890 cases with more than 25-year follow-up. Am J Cardiol. 2000; 85: 1045–1053.*

12.  *Criqui MH, Langer RD, Fronek A, et al. Mortality over a period of 10 years in patients with peripheral arterial disease. N Engl J Med. 1992; 326: 381–386.*

13.  *John A. Bittl, MD; Alan T. Hirsch, MD; Concomitant Peripheral Arterial Disease and Coronary Artery Disease, Therapeutic Opportunities; Circulation. 2004; 109: 3136–3144*