To Study the Correlation of Peripheralvascular Disease And Coronary Artery Disease (Myocardial Infarction)

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Abstract
Background: Peripheral arterial disease (PVD) is a progressive condition that causes stenosis and occlusion of non-cerebral and non-coronary arteries. Studies have suggested that even asymptomatic peripheral arterial disease is associated with increased CAD mortality.
Objectives
To evaluate for peripheral vascular disease in patients of myocardial infarction
To see the prevalence of PVD in these patients
To correlate the risk factors of atherosclerosis in patients of myocardial infarction with PVD
Method: Study was conducted in in Department of medicine, JAH Hospital, GRMC Gwalior over a time period of 1 year. Patient diagnosed to have myocardial infarction is included in our studies. Detailed clinical examination was done in all the patients.Peripheral pulses,xanthalesma, thickened pulse , ankle brachial index and blood pressure in all limbs. Arterial Doppler of both the lower limbs is done. Patients with evidence of peripheral vascular disease was correlated to incidence of MI.
Results: Out of the 100 patients with myocardial infarction 46 were found to have peripheral vascular disease and those with PVD are classified according to ABPI to mild moderate and severe (Out of total 46 patients of pvd 67.39% were having mild pvd,23.9% moderate and 8.69% were having severe PVD.25 out of 40 diabetics had pvd which is around 62.5% and 21 out of 60 non diabetics had pvd which is 35%. Out of 45 smokers 28had peripheral vascular disease which account for 62.2% and 18 out of 55 nonsmokers had pvd which is 32.7%.
Conclusion: This study evaluated peripheral vascular disease in patients of myocardial infarction. Of the patients with MI,smokers&diabetics had an increased prevalence of pvd which showed a statistical significance Majority of patients had mild pvd (abpi<0.9) followed by moderate and severe .Patients with one or more risk factors of MI had increased prevalence of PVD than those without any risk factors which shows statistical significance (p value 0.018). This study explains the need for management of peripheral vascular disease simultaneously in patients of myocardial infarction during their course of treatment, management and rehabilitation. The common risk factors for atherosclerosis causing MI & PVD should be addressed simultanously
Keywords: peripheral vascular disease, myocardial infarction, diabetics, smoking

I. Introduction

Peripheral arterial disease (PVD) is a progressive atherosclerotic condition that causes stenosis and occlusion of non-cerebral and non-coronary arteries,including those found in the extra-cranial carotid circulation, mesenteric circulation, renal circulation and the upper and lower extremities. Peripheral vascular disease (PVD), also known as arteriosclerosis obliterans, is aresult of atherosclerosis. Emboli, the most common cause of sudden ischemia, usually are of cardiac origin (80%); they also can originate from proximal atheroma, tumor, or foreign objects. The femoral artery bifurcation is the most common site (43%), followed by the iliac arteries (18%), the aorta (15%), and the popliteal arteries (15%). PVD rarely presents as an acute onset; it instead manifests a more chronic progression of symptoms. Other conditions that often coexist with PVD are coronary artery disease (CAD),atrialfibrillation, cerebrovascular disease, and renal disease. PVD that coexists with CAD may indicate an increased risk of atherosclerosis. Studies have suggested that even asymptomatic peripheral arterial disease (PVD) is associated with increased CAD mortality. Noninvasive tests for vascular disease—pulse wave velocity and ankle-brachial index—have been linked with the number of vessels obstructed with CAD.

Risk Factors
1. Smoking
2. Hyperlipidaemia
3. Diabetes mellitus
4. Hyper viscosity.
5. Hypertension
6. Obesity

Other etiologies for developing PVD may include phlebitis, injury or surgery, and autoimmune disease, including vasculitis, arthritis, or coagulopathy.

Abpi-Method Of Measuring

Principle: Blood flow to an organ is determined by the difference in pressure and fluid energy between large arteries and veins and by the vascular resistance within given vascular bed.

It is simple non-invasive test. In this systolic blood pressure is measured at ankle and arm. The same blood pressure cuff used for measurement of arm blood pressure should be used at the ankle[36]. At the ankle cuff should be tied just above malleolus.

ABPI   =   Systolic blood pressure at Ankle
Systolic blood pressure at arm

ABPI interpretation[36]:
- \>1.30 – non compressible
- 0.91-1.30- normal
- 0.51 -0.90 – mild-moderate vascular obstruction.
- <0.50 –severe vascular obstruction.

ABI>1.30 indicates significant medial wall calcification. The patients are at high risk of developing micro and macro vascular complications

II.   Aims & Objectives

1. To evaluate for peripheral vascular disease in patients of   myocardial infarction
2. To see the prevalence of PVD in these patients
3. To correlate the risk factors of atherosclerosis in patients of   myocardial infarction with PVD

III.   Material And Methods

Study area:
Department of medicine, JAH Hospital, GRMC Gwalior.
Study design:
Hospital based cross sectional study.
Sample size: 100 patients

Inclusion criteria:
- Age>18 YEARS and less than 80 yrs giving written consent.
- ECG suggestive of myocardial infarction

Exclusion criteria:
- Known case of PVD on treatment
- Deep vein thrombosis
- IV drug abusers
- Oedema of lower limb due to co morbid condition which impairs Doppler study & assessment of Ankle brachial index
- Patient not willing to participate in study

Methodology:

Patient diagnosed to have myocardial infarction is included in our studies . Detailed clinical examination was done in all the patients.Peripheral pulses, xanthalesma, thickened pulse , ankle brachial index and blood pressure in all limbs. Arterial Doppler of both the lower limbs is done. Patients with evidence of peripheral vascular disease was correlated to incidence of MI.

Statistical Method And Software
- Chi square test is the statistical method used in our study.
- Significant figures were analyzed
- Suggestive significance (P value : P<0.005)
- Software :SPSS version20.0

IV.   Results
Distribution Of Peripheral Vascular Disease In Relation To Gender

Gender	No. of cases	Percentage (%)
Male	38	82.60
Female	8	17.39

Of total number of PVDcases, 38 were males which account for 82.60% and 8 were females which is 17.39%

Distribution Of Age In Relation To Pvd

Age group (yrs)	No. of cases	Percentage (%)
18-29	1	2.17
30-44	5	10.86
45-64	22	47.8
> 65	18	39.13

Out of the total number of patients with PVD 47.8 % belonged to age group of 45-64 followed by 39.13% of cases above 65 yrs.Total of 86.93 % cases were above age of 45 yrs

Classification Of Pvd Based On Abpi Severity

	PVD	Total (Percentage)
Mild (0.89-0.7)	31	67.39
Moderate (0.69-0.4)	11	23.9
Severe (<0.4)	4	8.69
total	46	100

Out of total 46 patients of PVD 67.39% were having mild pvd,23.9% moderate PVD and 8.69% were having severe PVD.

Doppler Study In Pvd Patients

Doppler findings	NO. OF CASES
Anterior tibial thrombus	11(23.9)
Posterior tibial thrombus	11(23.9)
Anterior and posterior tibial thrombus	10(21.7)
Popliteal artery thrombus	5(10.8)
Diffuse atherosclerotic changes	9(19.56)

Of Doppler findings highest number of patient had both patchy anterior tibialthrombus(23.9%) and posterior tibial thrombus(23.9%) and lowest for popliteal artery thrombus(10.8%).

Distribution Of Pvd In Mi Patients Based On Risk Factors

	PVD	NO PVD	Total(N)	P VALUE
Mi with one or more risk factors	45	40	85	0.018
Mi without risk factors	3	12	15	

Patients with one or more risk factors under study for MI had increased prevalence of PVD (52.9%) than those patients without any risk factors .(20%) (p value-0.018)

Distribution Of Pvd In Relation To Diabetes

	PVD	Normal	Total(n)	P value
Present	25	15	40	.006
Absent	21	39	60	
Total	46	54	100	

25 out of 40 diabetics had PVD which is around 62.5% and 21 out of 60 non diabetics had PVD which is 35%.(p value 0.006)

Distribution Of Pvd In Relation To Smoking

	PVD	Normal	Total(n)	P value
Smokers	28	17	45	0.003
Non-smokers	18	37	55	
Total	46	54	100	

Out of 45 smokers 28had peripheral vascular disease which account for 62.2% and 18 out of 55 non smokers had PVD which is 32.7% (P value 0.003).

V. Discussion

Coronary artery disease is amongst most serious health problem all over the world including rapidly developing country like India where there is no respite from this problem. A good deal of advances has been made in the field of cardiovascular disorder as a whole and ischemic heart disease in particular. With the advent of diagnostic technique on one hand and facilities of modern biochemical tools on the other, the early detection and better appraisal of the disease is possible. Peripheral vascular diseae is one of the most missed and late diagnosed clinical entity in these patients. It has a role in detecting risk factors of atherosclerosis which need to be controlled ,otherwise can contribute towards both coronary and peripheral vascular events. The present study was carried out on patients of acute myocardial infarction with an aim to identify peripheral vascular disease in them. In our study population (n=100), majority of patients of MI were in age group of 45-64 which accounts for 48% and 33% patients were above 65 yrs. Total of 81% were above 45 yrs. Out of total MI patients 74 % were males and 26 % were females .Of total number of pvdcases , 38 were males which accounts for 82.6% AND 8 were females which is 17.39%Out of the total number of patients with PVD 47.8 % belonged to age group of 45-64 followed by 39.3 % of cases above 65 yrs.Total of 86.93 % cases were above age of 45 yrs.

Out of 45 smokers 28had peripheral vascular disease which account for 62.2% and 18 out of 55 non smokers had pvd which is 32.7% (P value 0.003).25 out of 40 diabetics had pvd which is around 62.5% and 21 out of 60 non diabetics had pvd which is 35%.(p value 0.006)

Out of total 38 patients of pvd 67.39% were having mild pvd, 23.9% moderate pvd and 8.69% were having severe pvd.Of Doppler findings highest number of patient had both anterior tibialthrombus(23.9%) and posterior tibial thrombus(23.9%)   and lowest for popliteal tibial thrombus(10.8%). Out of 100 patients of myocardial infarction 46 had peripheral vascular disease which accounts for 46%.Patients with one or more risk factors under study for MI had increased prevalence of PVD (52%) than those patients without any risk factors(20%)(p value-0.018)

VI. Conclusions

Patients with increased age have higher prevalence of pvd with majority in 4-5 th decade followed by 6 th decade. Smoking and diabetics are two important risk factors in the pathogenesis of atherosclerosis and clearly have preventive potential in risk populations of MI and PVD.ABPI is a sensitive indicator for PVDThis study explains the need for management of peripheral vascular disease simultaneously in patients of myocardial infarction during their course of treatment, management and rehabilitation.Patient with ischemic cardiac symptoms should be simultaneously evaluated for peripheral vascular disease for improving their claudication symptoms and quality of life and hence help in controlling modifiable risk factors responsible for atherosclerosis predisposing to both pvd and acute coronary syndromes

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