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Co Morbidities and Prescription Patterns in Patients with Peripheral Vascular Disease in a Tertiary Care Hospital in India

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Abstract: Peripheral Vascular Disease (PVD) is associated with number of co-morbid conditions and usually requires multiple drugs to treat them. The purpose of this study was to determine the co-morbid conditions and prescription patterns in patients with PVD. The case records of 150 patients attending vascular surgery department was studied in this open label observational study. Out of 150 case records analyzed, peripheral arterial disease was more common than venous disease. The frequency of hypertension was similar in both arterial and venous disease but diabetes and obesity was more commonly associated with arterial disease than venous disease. The antiplatelet, hypolipidemic and anticoagulants were prescribed in commonly prescribed drugs to prevent cardio vascular complications Peripheral vascular disease is commonly associated with co morbidities which clinicians should detect and consider while treating the primary disease of patients.

Key words: Peripheral Vascular Disease · Co Morbidities · Prescription Pattern

INTRODUCTION

Peripheral vascular disease (PVD) is a major cause of morbidity and mortality in the elderly population [1-3]. The prevalence of peripheral vascular disease (PVD) ranges from 3% to 20% in the elderly people [4]. The Chennai Urban Population Study, an epidemiological study conducted in south India showed the overall prevalence of 3.2% and known diabetic subjects had a higher (7.5%) prevalence of PVD [5].

Venous and arterial diseases have been traditionally considered to be two distinct pathophysiological entities. But now it is observed that there are some common risk factors for these two disorders. There is biological plausibility to the concept that atherosclerosis and venous diseases may have a similar pathogenesis. In both arterial and venous thrombosis, activation of endothelium, platelets and leukocytes can be demonstrated, setting the prothrombotic stage for thrombus formation in the veins as well as arteries [6].Other factors associated with arterial and venous thrombosis are high levels of clotting components, older age, obesity, smoking, dyslipidemia and hormonal agents [7] (Table 1).

Table 1: Common features of arterial and venous thrombosis.

Hemostatic Factors	Platelet activation
	Depressed endothelial nitric acid production
	High intrinsic clotting factor concentrations
	Increased fibrinogen, dysfibrinogenemia, impaired fibrinolysis
Lifestyle Factors	Older Age
	Obesity
	Smoking
Others	Inflammatory cytokines (ie, IL-6)
	Dyslipidemia
	Hyperhomocysteinemia
	Estrogens, anti-estrogens, oral contraceptives

The incidence of major cardiovascular events in Peripheral Vascular Disease patients is high if it is associated with other co-morbidities like diabetes, smoking and hypertension; indeed the risk factors for PVD itself appear to differ in different populations. A study from China reported that hypertension, diabetes, elevated serum cholesterol, LDL cholesterol, triglycerides, fibrinogen and hyperglycemia are associated with PVD. A study from United States of America showed diabetes to be the major risk factor for PVD. In Greece, serum triglycerides alone were found to be associated with PVD

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in diabetic subjects. A prospective study on type 2 diabetes showed triglycerides, HDL cholesterol, hypertension and smoking as risk factors for PVD. Other reports showed microalbuminuria, homocysteine and lipoprotein (a) to be associated with PVD. Several studies have shown that the prevalence of coronary artery disease (CAD) is very high among Asian Indians. Unfortunately, there is very little epidemiological data on PVD in Indians and the risk factors associated with PVD in Indian population. To our knowledge there are very few and small studies on the co morbidities and risk factors associated with the peripheral arterial and venous disease in Indian population. The management of peripheral vascular disease thus depends on the primary arterial or venous diseases and the associated co morbidities and complications. Thus, this article attempts to study the associated co-morbidities and risk factors in patients with peripheral arterial and venous disease and the treatment prescribed to these patients.

MATERIALS AND METHODS

The present observational study was conducted in the department of vascular surgery after obtaining the required approvals. The case records of 150 patients admitted between January to june 2013 with either isolated peripheral arterial or peripheral venous disease was included and those with mixed arterial and venous disease were excluded. The detail of patients including demography, medical history, ABI and treatment prescribed was recorded in the case record forms. The data was analyzed using graph pad prism software version 6.

RESULTS

Out of 150 patients 75.33% had arterial and 24.66% had venous disease. The demographic characteristics and co morbidities in both the sexes suffering from peripheral arterial and venous disease are given in Table 2.

The mean age of the patients was higher in arterial disease and females more frequently had venous disease. Claudication pain and leg ulcers were more common in arterial disease and varicose veins in venous disease.

The mean BMI was higher and obesity more common in venous disease than the patients with arterial disease. The association between arterial and venous disease with obesity was found to be highly significant statistically ($p<0.05$).

The frequency of hypertension was similar in both arterial and venous disease but diabetes was more commonly associated with arterial disease than venous disease. The risk factor of smoking was seen in 51.77% males, which was again more common arterial than in venous disease patients ($p<0.05$) and an average of 1.36 packs were smoked per day by these patients.

The analysis of commonly prescribed medicines in the patients with peripheral vascular disease (Table 3).

Antithrombotics, anticoagulants were prescribed both in patients with arterial and venous disease. Tablet clopidogrel along with aspirin was most common oral antithrombotic prescribed. The parenteral anticoagulants were frequently prescribed to patients with venous disease at the time of discharge compared to oral anticoagulants. Hypolipidemic drugs were prescribed more frequently in patients with arterial disease than venous disease. The tablet rosuvastatin was most commonly prescribed statin in the arterial patients.

Table 2: Demographic characteristics and co morbidities in both the sexes suffering from peripheral arterial and venous disease:

Demography and co-morbidities in peripheral arterial disease patients (n=113)			Demography and co morbidities in peripheral venous disease patients (n=37)		P value for difference between arterial and venous disease
n=150	Males	Females	Males	Females	
Frequency	96 (84.95%)	17 (15.04%)	31 (83.78%)	6 (16.21%)	P<0.05
Mean Age	47.67±13.12	44.82±21.19	41.61±10.53	44.16±16.27	P<0.05
ABI	0.806	0.725	Not recorded	Not recorded	Not applicable
BMI	22.92±4.16	21.95±4.85	27.4±5.22	28.85±4.83	P<0.05
BMI>25	21.87%	11.76%	42.93%	33.33%	P=0.01
BMI>30	4.16%	5.88%	35.48%	33.33%	P=0.0001
Rest pain	38 (39.58%)	8 (47.05%)	3 (9.67%)	0	P<0.05
Varicose veins	0	0	5 (16.12%)	3 (50%)	P<0.05
Ulceration	28 (29.16%)	4 (23.52%)	4 (12.9%)	1(16.66%)	Not significant
HTN	26 (27.08%)	5 (29.41%)	9 (24.32%)	0	Not significant
DM	38 (39.58%)	8 (47.05%)	3 (8.1%)	0	P=0.0002
CAD	6 (6.25%)	0	1(3.22%)	0	Not significant
Smoking	62 (54.86%)	0	6 (16.21%)	0	P=0.0001

Table 3: Use of common drugs in peripheral arterial and venous disease patients:

Group of drugs	Peripheral arterial disease n=113	Peripheral venous disease n=37	P value for difference between arterial and venous disease
Oral Antithrombotics and Anticoagulants Parenteral	88.49% (3%)	45.94% (27.02%)	P=0.0001
Hypolipidemic drugs	78(69.02%)	14(37.83%)	P=0.001
1. Atorvastatin	18(23.07%)	1(2.7%)	
2. Atorvastatin+Ezetimibe	0	1(2.7%)	
3. Rosovastatin	55(70.51%)	12(32.43%)	
4. Rosuvastatin+Finofibrate	1(1.28%)	0	
5. Finofibrate	1(1.28%)	0	
6. Simvastatin	3(3.84%)	0	
Antibiotics prescribed during treatment	51(45.13%)	18(48.64%)	p=0.7
Analgesics	82 (72.56%)	25 (67.56%)	p=0.5
Tab. Diltiazem	69 (61.06%)	1 (2.7%)	P=0.0001
Tab. Cilostazole	39 (34.51%)	0	P<0.05
Inj. Prostaglandin E-1	31.25%	5.4%	P=0.001
Crepe bandage	6(5.3%)	26 (70.27%)	P<0.05

Table Diltiazem and Injection Prostaglandin E-1 were the other commonly prescribed drugs in arterial disease patients. Analgesics and antibiotics were prescribed more commonly with no significant difference observed in arterial or venous disease patients. Tablet cilostazole was prescribed exclusively in patients with arterial disease. Usage of crepe bandage was commonly advised (70%) for patients with venous disease.

DISCUSSION

Several studies have shown that the prevalence of coronary artery disease (CAD) is very high among Asian Indians [8] and the prevalence of peripheral vascular disease is also rising. Chennai Urban Population study estimated that the overall prevalence of PVD as 3.2% in an epidemiological study with higher prevalence (7.5%) among diabetic patients. Out of 150 of patients admitted in vascular surgery 113 patients (75.33%) had arterial disease and 37(24.66%) had venous disease. The arterial cause for peripheral vascular disease predominated over venous causes as the risk factors for peripheral artery disease such as diabetes, smoking, obesity and hypertension is more prevalent in Indian patients. The arterial disease patients are admitted with acute pain and symptoms due to critical ischemia. In this study, males outnumbered females with male: female ratio of 5:1. This is in correlation with the Framingham study, where the prevalence of peripheral vascular disease was also seen more in males [9].

The risk factors for PVD itself appear to differ in different populations. In the present study, diabetes, hypertension and smoking were found to be associated with peripheral artery disease and obesity was strongly associated with peripheral venous disease along with hypertension. The overall prevalence of hypertension in the present study in male patients with peripheral vascular disease was 27.7% compared to prevalence in general population of 23.10 according to the World Health Organisation's 'global health statistics 2012', the difference in prevalence among females was insignificant. The overall prevalence of diabetes in peripheral artery disease patients in this study is 30% which is significantly higher than the reported prevalence of diabetes in the general population of 9% [10]. Prothrombotic nature in arterial disease patients may be because of hyperglycemia, hypertension, hyperlipidemia, platelet factors and other factors that are increased in diabetic subjects. The Chennai Urban Population study also reported higher prevalence of peripheral artery disease in diabetic patients. There are several risk factors for peripheral vascular disease and many biochemical markers are also found to be associated with the progression of the arterial disease [11]. The present study analysed few of the risk factors and co morbidities due to limited resources. It was found that the diabetes, hypertension and smoking were more frequently observed in patients with peripheral arterial disease and obesity was more strongly associated with the patients of peripheral venous disease. Peripheral vascular disease is commonly associated with co morbidities like hypertension, diabetes, smoking and obesity. The clinicians should detect and consider treating the associated co-morbid conditions adequately while treating primary disease of patients.

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