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Prevalence of peripheral arterial disease & associated risk factors among type 2 diabetes mellitus patients attending diabetic health camp

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Abstract
Background: India is Diabetic capital of the world. The prevalence of peripheral arterial disease (PAD) in diabetic patients is found to be 3.2% in a study from South India and as high as 15.9% in a western population. Peripheral vascular disease has largely been ignored, especially in small cites. Hence present study was carried out to assess the prevalence of PAD in type 2 diabetes (T2DM) patients by measuring ankle brachial index (ABI) in Darbhanga, Bihar.
Objective: To find out the prevalence of PAD and some risk factors associated with it, in T2DM patients attending health camps.
Methods: Study Design: Health camp based cross sectional study. Study Population: T2DM patients attending 4 health camps. Sample Size: 124. Duration: From 2nd Sept. 2017 to 18th March 2018. Data collection: From the subjects by interview method using pre tested semi-structured Proforma.ABI screening was done through Hand held Doppler. Individual ABI was obtained for each leg by dividing corresponding ankle pressure by the brachial pressure. The lower of the values obtained for the two legs was taken as the true ABI. A cut off of < 0.9 was used to define peripheral arterial disease (PAD). Data analysis: Using Med-calc and Microsoft Excel.
Results: The prevalence of PAD was 16.9% (21/124). Mean age (95%CI) of study population was 35.01 (32.8 to 37.3) yrs. Mean age (95%CI) of PAD cases were 52.42 (46.7 to 58.15) yrs. Risk of it has the association with Age, Smoking, Duration of disease, Hypertension, and no association with sex.
Discussion: Using Ankle brachial index, we found evidence of PAD in 16.9% of type 2 diabetics. Risk factors significantly associated with PAD were higher age, longer duration of diabetes, high blood pressure and smoking and obesity. This finding suggests prevalence is also increasing in small city and special attention is needed before the complication advances. The Medical officer should be given training for diagnosis and management that is lacking in periphery.

Keywords: peripheral arterial disease (PAD), diabetic, Peripheral vascular disease

Introduction

Peripheral arterial disease (PAD) has an important place in health care due to its high incidence and prevalence among Diabetic patients, as well as its consequences. Peripheral arterial disease (PAD) is a vascular disease caused by an occlusion of a peripheral arterial vessel and is a marker for atherothrombotic disease. Clinically it may manifest as intermittent claudication and rest pain. Patients with Type 2 DM are 20 times more likely to develop PAD of the lower extremities. The risk of lower extremity amputation and mortality are also higher in diabetics compared to non-diabetics. The American Diabetic Association has estimated that 40-50% of the diabetic related amputations are preventable. Therefore early detection of PAD in the diabetic population is very important. The prevalence of PAD among patients with DM is found to vary between 10-42%. It was found 3.2% in a study from South lndia and as high as 15.9% in a western population. Possible risk factors for PAD in patients with DM include increasing age, duration of DM, smoking, hypertension, hyperlipidaemia and increased waist to hip ratio.

Ankle brachial index (ABI) is an effective method used to detect PAD. The sensitivity of ABI is 90% and the specificity is 98% for an angiographically defined stenosis of 50% or more in a major leg artery. However, in patients with DM, the detection of PAD may be complicated by the presence of peripheral neuropathy, as ischemic symptoms are usually not felt due to reduced sensation, and the presence of calcification of medial arteries.

Methods

This is a cross-sectionalstudy, with 124 patients (69 men and 55women), design to estimate the prevalence of PAD among adults aged 20 years above. Four free Diabetic health camp were organized at Darbhanga District.to collect data, using a pre tested semi-structured Proforma. Each patient gave written, informed consent to participate in the study and the study protocol was approved by the institutional review board including ethical issues.

Inclusion criteria for the study

1. A diagnosis of type 2 diabetes mellitus as per WHO criteria.
2. Treatment with dietary restrictions and / or oral hypoglycaemic agents and / or insulin for at least 6 months.

Patients with Leg ulcers which could interfere with the measurement of the ankle brachial index, were excluded. A detailed history was obtained from each patient. This included age, sex, smoking, diabetes mellitus - duration, Height and weight. Each patient was examined with particular attention to blood pressure (as per JNC7 criteria) and body mass index (weight (kg) / height (metre)2

ABI study

The arteries of the lower limbs were assessed using a 8 Mhz hand held Doppler probe, with patients in the supine position. Brachial artery systolic pressure was first measured in both arms. Similarly, ankle blood pressure was measured with the cuff placed just above the ankle and then by measuring Doppler blood flow in the dorsalis pedis artery or the posterior tibial artery of both feet. Individual ABI was obtained for each leg by dividing corresponding ankle pressure by the brachial pressure. The lower of the values obtained for the two legs was taken as the true ABI. An ABI of < 0.9 was defined as a low ABI indicative of peripheral arterial disease.

Statistical Analysis

The prevalence of PAD was calculated. Comparison between categorical variables was examined using chi-square, adopting a level of significance for $P < 0.05$. All statistical analyses were performed using a statistical software Med-calc and Microsoft Excel.

Results

A total of 124 patients (69 men and 55women) with type 2 diabetes were included in the study. Mean age (95%CI) of study population was 35.01 (32.8 to 37.3) yrs. Mean age (95%CI) of PAD cases were 52.42 (46.7 to 58.15) yrs. Demographic and clinical features of these patients are shown in Table 1. Overall the prevalence of PAD was 16.9% (21/124) and male prevalence of PAD was 15 (21.7%), Female prevalence of PAD was 6 (10.9%). Risk of it has the association with Hypertension, Smoking and obesity. There was no association with sex which are shown in Table 2. Fig 1 and Fig.2, Box and whisker diagram showing PAD prevalence relation with age and Duration of disease respectively

Table 1: Demographic and clinical profile of patients in the study group

Variables	Male (n=69)	Female (n=55)	Total (n=124)
Age (years) (Mean ± SD)	36.145±13.942	33.600±10.480	35.016 ±12.542
Duration of diabetes (years) (Mean± SD)	5.0580±5.297	4.055±3.860	4.6129±4.723
History of hypertension	31 (44.9%)	19 (34.5%)	50 (40.3%)
History of Obesity	15 (21.7%)	20 (36.36%)	35 (28.22%)
History of Smoking	11 (15.9%)	23 (41.8%)	34 (27.4%)
PAD	15 (21.7%)	6 (10.9%)	21 (16.9%)

Table 2: Association of PAD with some studied variables

Variables		No PAD	PAD	Total	Chi Square	Significance
Sex	Male	54	15	69(55.6%)	1.840	P = 0.1750
	Female	49	6	55(44.4%)		
Hypertension	No	72	2	74(59.7%)	23.978	P < 0.0001
	Yes	31	19	50(40.3%)		
Obesity	No	79	10	89(71.8%)	5.917	P = 0.0150
	Yes	24	11	35(28.2%)		
Smoking	No	86	4	90(72.6%)	33.239	P < 0.0001
	Yes	17	17	34(27.4%)		

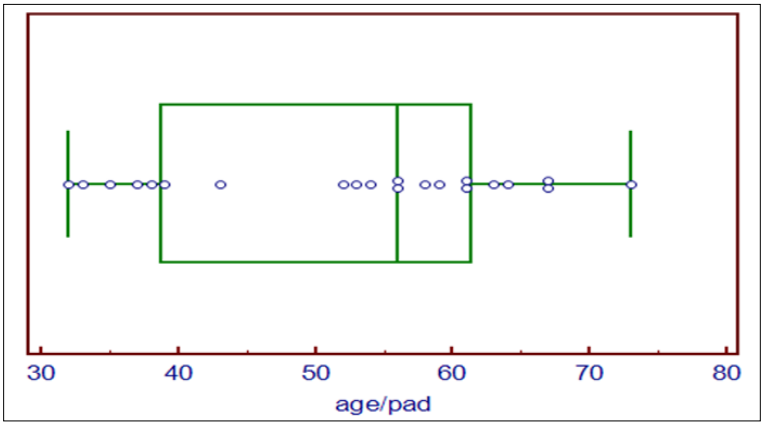

Fig 1: Box and whisker diagram showing PAD prevalence with age)

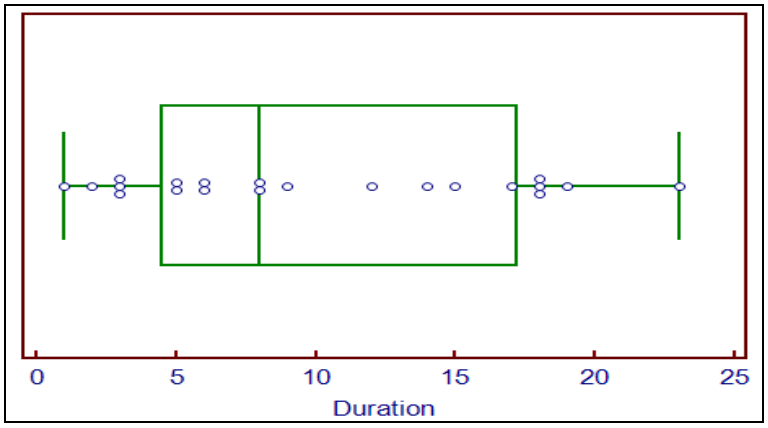

Fig 2: Box and whisker diagram showing PAD prevalence with Duration of Disease)

Discussion

Using Ankle brachial index, we found evidence of PAD in 16.9% of type 2 diabetics. Risk factors significantly associated with PAD were higher age, longer duration of diabetes, high blood pressure and smoking and obesity. This finding suggests prevalence is also increasing in small city and special attention is needed before the complication advances. The Medical officer should be given training for diagnosis and management that is lacking in periphery.

Conclusion

Prevalence of PAD without any other comorbidity is high and it appears to be a hidden disease in the community. It is an emerging public health concern even in small cities. A simple ABI measurement identified a large number of patients with previously unrecognized PAD. In clinical practice, PAD is often missed or under diagnosed, especially in patients with Type 2 Diabetes Mellitus who may remain free of any symptoms till the disease reaches an advanced, irreversible stage. The problem may not come to light until it is too late due to co-existing diabetic neuropathy. Regular use of ABI may help in early detection and management of PAD and in prevention of the complications. Special attention is needed before the complication advances. The Medical officer should be given training for diagnosis and management that is lacking in periphery.

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