



“ A STUDY OF PERIPHERAL VASCULAR DISEASE IN TYPE-2 DIABETES MELLITUS USING ANKLE BRACHIAL INDEX

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ABSTRACT The objective of the present study was to study the prevalence of peripheral vascular disease in Type 2 Diabetes Mellitus patients. A total of 100 T2DM patients (67 males and 33 females) were studied for detection of peripheral vascular disease (PVD) by Ankle Brachial Index (ABI). It was observed that 13% cases were positive for PVD. Long duration of Diabetes, Hypertension, and Obesity were found to be predisposing factors. Studies on PVD in T2DM patients are of clinical importance as PVD is a strong predictor of Cardiovascular Ischemic events.

KEYWORDS :

INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is considered as the most common Endocrinological disorder characterized by chronic hyperglycemia and disturbances of carbohydrate, fat and protein metabolism with relative deficiency in Insulin secretion and/or Insulin action (1, 2). The role of genetic factors, dietary habits, Obesity and Sedentary lifestyle are implicated in the causation of this metabolic disorder. Studies carried out on the prevalence of T2DM in Urban areas of India concluded a prevalence rate of 12.1% (3,4). High morbidity and mortality associated with T2DM is attributed to the chronic micro and macro angiopathies associated with the disease (5). The various micro vascular complications observed in T2DM are: Retinopathy, Nephropathy and Neuropathy. The macro vascular complications include coronary artery disease (CAD), Cerebrovascular and peripheral vascular disease (5).

Clinical studies on Peripheral Vascular Disease (PVD) assume significance as it has been reported to affect nearly 10million people in India (6). It is a common cause of morbidity among men and women above the age of 40 years (6). The prevalence of PVD in various Western Countries ranges from 4.65% to 19.1% (7). Peripheral arterial disease is not uncommon but is a commonly neglected condition. The main symptom is claudication but majority of patients are asymptomatic. Ankle Brachial Index (ABI) is considered as an effective method of screening PAD. It has been reported that there is strong correlation between PVD and CAD, Cerebrovascular disease and related mortality. It is estimated that 5 year mortality rate was 30% in PVD of which 75% deaths are due to cardiovascular causes. It is significant to note that mortality in CVD and CAD depends on severity of PVD. In view of high morbidity and mortality associated with PVD and a strong correlation between PVD and cerebrovascular disease mortality the present study was conducted with the objective of detecting PVD in T2DM in relation to age, gender, glycemic control and other co-morbid factors like Hypertension, CAD etc.

Materials and Methods

The study was conducted at Princess Esra Hospital and Owaisi Hospital and Research Centre, Deccan College of Medical Sciences, Hyderabad during the period 2015-2017. Institutional Ethics Committee's approval was taken prior to initiation of research study. A total of 100 randomly selected cases of T2DM admitted in different medical wards were selected. These cases fulfilled the inclusion criteria. The inclusion criteria was, Diagnosed cases of T2DM above age of 30 years irrespective of sex and duration of diabetes.

For clinical evaluation of Peripheral Vascular Disease, Ankle Brachial Index (ABI) was calculated using non-invasive colour Doppler. In the

present study 5-10 MHZ linear transducer of Toshiba Core Vision ultrasound and Siemens G-50 equipment with colour pulse Doppler facility were used for measurement of Ankle Brachial Index (ABI) (8). An ABI of less than 0.9 was taken as a positive marker of PVD (8).

RESULTS

The age of patients ranged from 39-62 years and mean age was 49.31± 6.08 years. There were 67 males and 33 females with a ratio of 2 males to 1 female. 48% of the cases were in the age group 41-50 years and 38% in the age group 51-60 years (Table-1). About 44% patients had a duration of disease of 0-5 years, while 28% had a long duration of disease (>15 years) (Table-2). Mean duration of disease in PVD patients was 18.08 ± 3.30 years and in Non-PVD 8.33 ± 6.39 years (p< 0.05). Studies on Ankle Brachial Index revealed that 13% of patients (13 out of 100 T2DM cases) were positive for peripheral vascular disease (PVD) (Table-3). Of these 10 were males and 3 were females. It was interesting to note that 9 out of 13 PVD positive cases belonged to age group 51- 60 years. It appears that long duration of disease along with hypertension, obesity were important predisposing factors. The co-morbid factors associated with PVD are CAD, Angina and Cerebrovascular disease. In PVD positive patient's frequency of hypertension, Angina was significantly higher than Non-PVD cases.

Table 1. Age and Sex distribution of study population.

Age (yrs)	Males	Females	Total
31-40	06(6%)	02(2%)	08(8%)
41-50	32(32%)	16(16%)	48(48%)
51-60	25(25%)	13(13%)	38(38%)
61-65	04(4%)	02(2%)	06(6%)
Total	67(67%)	33(33%)	100(100%)

Table 2. Duration of diabetes in study population.

Duration in years	Male	Female	Total
0-5yrs	27(27%)	17(17%)	44(44%)
6-10yrs	08(8%)	03(3%)	11(11%)
11-15yrs	11(11%)	6(6%)	17(17%)
> 15yrs	21(21%)	07(7%)	28(28%)
Total	67(67%)	33(33%)	100(100%)

Table 3. Showing occurrence of PVD in study population using ABI.

ABI	No. of patients		Total
	Males	Females	
<0.5	01	-	01

0.6- <0.9	10	02	12
>0.9-1.3	56	31	87
Total	67	33	100

DISCUSSION

Detection of PVD in T2DM patients is important in view of high risk of PVD in these patients. Moreover screening for PVD is of clinical importance as it is associated with increased risk of claudication, Ischemic ulcers, gangrene, and sometimes even amputation. Apart from these the PVD is also a marker for generalized atherosclerosis and a predictor of cardiovascular ischemic events.

In the present study we observed a prevalence rate of 13% for PVD in 100 T2DM patients studied for detection of PVD by Ankle Brachial Index.

ABI has been used in a considerable number of studies and is believed to be a reliable method of identifying Peripheral Vascular Disease. (A score of <0.9 is taken as a positive test). In a similar study on PVD from South India, Premalatha et al also observed the prevalence of PVD to be 11.8 % in diabetic patients which is similar to our observation. (8)

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