



To Know The Prevalence of Lower Extremity Peripheral Arterial Disease (PAD) and Peripheral Neuropathy (PN) in Diabetic Patients, in AIMSR, Bathinda

KEYWORDS

Diabetes Mellitus, peripheral vascular disease ,peripheral neuropathy

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ABSTRACT

AIM AND OBJECTIVE: - To know the prevalence of lower extremity peripheral arterial disease (PAD) and peripheral neuropathy (PN) in diabetic patients and compare the result with non diabetic patients.

MATERIAL AND METHODS: This is a retrospective study conducted in AIMSR, Bathinda, Punjab from 1st August 2014 .The study was carried out randomly in 1000 patients who attended medicine OPD or referred to surgery OPD from medicine OPD for the management of surgical complication of DM. Clearance from the institutional ethical committee was obtained for the study.

INCLUSION CRITERIA: Patients of both gender male and female aged between ≥ 20 years to ≤ 70 years ,who were either a diagnosed case of diabetes or who presented with complain of calf pain in either leg while walking, or had numbness, loss of feeling , or painful sensations or tingling in their feet or any symptoms and signs suggestive of diabetes mellitus, were taken up randomly for the purpose of study

Detailed history was taken and thorough clinical examination was done in all the patients. PAD and PN was assessed with the help of non invasive tests and duplex color Doppler study

Assessment of PAD - This was done by determining the ABI. ABI is the ratio of systolic blood pressure in the ankles (posterior tibial vessel) to that in the right arm (right brachial vessel). Measurements were taken in supine position. Patient were considered to be suffering from PAD if ABI was < 0.9 in either leg and if ABI < 0.7 then this indicated patients to be suffering from moderate to severe PAD.

If the patient gets calf pain in either leg while walking then he/she was classified as symptomatic PAD

Assessment of PN - PN was assessed by symptoms of numbness, loss of feeling or painful sensation or tingling in their feet and by a non invasive test with a standard mono filament (5.07-gauge Semmer-Weinstein nylon).

Pressure was applied with the mono-filament at three sites (Planter, first metatarsal head; Planter, fifth metatarsal head; Planter, hallux) on the bottom of each foot (i.e. a total of six sites).

The site was considered insensate if on application of monofilament to the foot on three times, the participant incorrectly determined on two of three applications. Impaired sensation was quantified by the total number of insensate areas for both feet (range 0-6), and PN was classified as > 1 insensate area.

RESULTS: The study results are comparable to other studies. **CONCLUSION:** Diabetes mellitus increases the risk of PAD, PN almost two times than the overall population.

INTRODUCTION-Diabetes Mellitus(DM) is a major risk factor for cardiovascular disease and PAD (Peripheral Arterial disease) is recognized as one of the major complications. PAD is developed at least two folds in DM patients.¹

Compared with patients without DM ,patients with DM along with PAD and younger ,with higher BMI(body mass index)&suffer from various neuropathies & cardiovascular co-morbidities .The presence of DM increases the risk of mortality in PAD.² Diabetes is also recognized to complicate the treatment of PAD and have more surgical complications.³⁻⁴

DM limits the amount of collateral development and there is decreased response to adaptation due to blood flow obstruction.⁵Vascular dysfunction in Diabetes :Constant hyperglycemia ,oxidative stress, formation of AGEs(Advanced glycosylation and products &PKC(protein kinase C)production, adversely affect vascular function .In addition ,in Type2 DM ,the vascular function is affected by constant low grade inflammation of the endothelium ⁶ and several imbalances ,including hypertension and hyperlipidemia which also affect vascular structure and function.⁷⁻⁸ There is decreased wall/lumen ratio and a stiffer vessel wall in

Diabetic artery as compared with non diabetic artery due to change in phenotype and function of endothelium & smooth muscle, and an altered structure and composition of the extracellular matrix in diabetic artery.^{9,10,11} Size and region play an important role on the effect of DM on vessel.¹² This study will be done to know the prevalence of peripheral arterial disease (PAD) and peripheral neuropathy (PN) in lower extremity in diabetic patients and compare the result with non diabetic patients.

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OBSERVATION AND RESULT:

	SAMPLE SIZE- n=1000	Non Diabetic-n=650				DIABETIC-n= 350			
		PAD- n=68		PN- n=109		PAD-n=73		PN- n=117	
AGE		S-n=23	AS-n=45	S-n=27	AS-n=82	S-n=23	AS-n=50	S-n=45	AS-n=72
20-40	200	1	5	5	7	2	8	1	3
41-60	680	17	38	18	70	6	37	4	61
61-80	120	5	2	4	5	15	5	40	8
SEX									
Male	670	18	33	21	67	18	39	33	58
Female	330	5	12	6	15	5	11	12	14

Table 1
S: Symptomatic, AS: Asymptomatic

Prevalence of diabetes in adult population

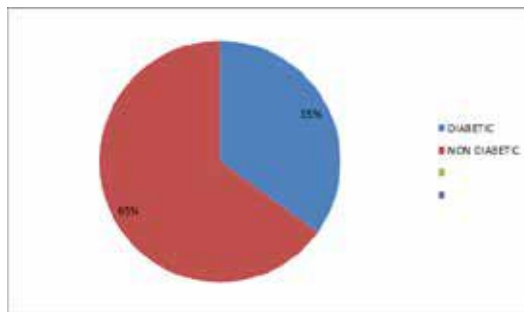


Figure 1

Prevalence of PAD, PN, foot ulcer, and symptoms in adult population, with and without diabetes.()

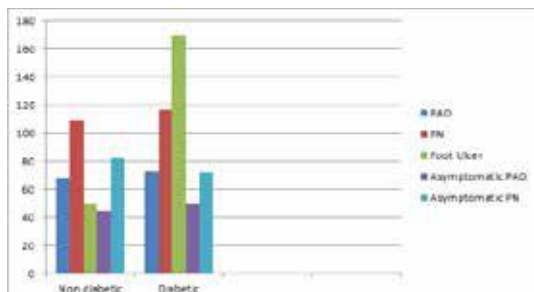


Figure 2

PAD- peripheral arterial disease, PN - peripheral neuropathy

There were total 1000 number of overall patients attending the medicine OPD and surgical OPD (referred from medicine OPD for lower extremity ulcer) of AIMSR , out of which 350 no. of patients were diagnosed as suffering from DM .

There were 5% of patients in the age group of 20-30 years who were suffering from diabetes.

PAD in Non diabetic was present in 68 patients(10.5%).Out of which 2/3rd were asymptomatic (45) and 1/3rd had ABI <0.7 (23).

PN was present in 109 patients in Non Diabetic group (16.8%). Out of which 3/4th was asymptomatic (82) and 1/4th were symptomatic (27).

There were 74 patients in diabetic group who were suffering from PAD (21%), Out of which 68% were asymptomatic. Prevalence of PN in DM group was 33.6% (117.6).Out of which 62% were asymptomatic.

DISCUSSION

Diabetes mellitus (DM) which is commonly known as-diabetes is a common and serious metabolic disease in which there is high blood sugar level over a prolonged period and if left uncontrolled it can cause many complications.

Comprehensive data are not available but studies have done in various states of India which suggests recent prevalence of diabetes ranges from 5.3% to 13.6% in different areas .¹³ In other study prevalence of DM in patients attending the medicine and surgery OPD was 35%.The age at detection of DM has decreased over the period with urban metropolitan data suggesting nearly 5% of DM detected in the age group of 25-34 years .¹⁴ In our studies approximately 5%of patients

are detected at the age group of 25-34 years or less. Besides conventional factors like urbanization, industrialization and aging, other factors which contribute to development of DM are obesity, higher percentage of body fat and genetic factors.¹⁵ Diabetes control in patients suffering from it worsens with the duration of disease.¹⁶ In one study 4.5% of overall cases who had undergone study, were suffering from PAD and approx. two third of them, were asymptomatic, and about 1/3rd have ABI <0.7. Approx 14.8% of overall cases were suffering from PM and 3/4th of cases out of them were asymptomatic and 1 half of them had 2 or more insensate area and 1/4th had 3 or more insensate area.¹⁷

As with previous studies, in our study also most of the cases of PAD and PN are asymptomatic,^{18,19,20}

Atherosclerotic etiology of PAD and coronary heart disease is almost same.²¹

Among diabetic patients, intensive glycaemic control plays an important role in slowing down of progression of PN,^{22,23} and risk of amputation can be reduced by early detection and aggressive care of ulcers.²⁴

Longer duration of Disease Worsen the Diabetes Control.²⁵

The most common complication is neuropathy (24.6%), followed by cardiovascular complication (23.6%), renal (21.1%), retinopathy (16.6%), foot ulcers (5.5%).²⁶

In our study data poor glycaemic control is one of the major factors in Indian population, responsible for various micro and macro vascular complication leading to PAD, diabetic myonecrosis,²⁷ muscle infarction²⁸

CONCLUSION:

Diabetes mellitus increases the risk of PAD, PN almost two times than the overall population.

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