

ORIGINAL ARTICLE

PREVALENCE OF COMPLICATIONS IN
TYPE 2 DIABETES MELLITUS PATIENTS

Muhammad Ishaq, Ghulam Jillani Khan*, Shafiq ur Rahman*, Sibgha Zulfiqar**

Department of Physiology, Bannu Medical College, Bannu, *Department of Physiology, Khyber Medical College, Peshawar,

**Department of Physiology, Shaikh Zayed, Federal Postgraduate Medical Institute, Lahore, Pakistan

Background: Intermittent claudication mainly attributable to peripheral arterial disease is the experiencing of pain in legs, especially calf muscles, during walking and diabetic peripheral neuropathies are the commonest sequelae of diabetes mellitus. Diabetic peripheral neuropathies affect up to 50% of US patients with type 1 and type 2 diabetes mellitus. The purpose of the current study was to know about the prevalence of complications in type 2 diabetics in Lahore, Pakistan. **Methods:** The study was conducted at Shaikh Zayed Federal Postgraduate Medical Institute, Lahore, from 2008 to 2010. A total of 150 patients, aged ≥ 40 years with type 2 diabetes mellitus, were selected from the Diabetic Clinic, Cardiology Unit, and Biochemistry Department of the Institute. The subjects were equally divided into uncomplicated (n=75) and complicated (n=75) groups. Blood pressures, ABI, BMI and neurological symptoms of each patient were recorded consequently. The 'Edinburgh Claudication Questionnaire' was used to assess intermittent claudication. The urine of each patient was tested for microalbuminuria to label him as complicated type 2 diabetic or otherwise. **Results:** In both groups about 8% individuals experienced generalised pain and 3% felt numbness. Tingling sensations in the uncomplicated group were experienced by none but 2.7% of the individuals in the complicated group complained about the ailment. No patient was suffering from intermittent claudication in the uncomplicated group but 6.7% of the individuals in the complicated group reported the problem. This was the only complaint where the difference between the groups was significant statistically ($p < 0.05$).

Conclusion: The occurrence of complications particularly intermittent claudication in type 2 diabetics is more frequent compared to uncomplicated type 2 diabetes mellitus patients.

Keywords: Intermittent Claudication, Peripheral Neuropathies and Type 2 Diabetes Mellitus

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INTRODUCTION

Intermittent claudication (IC) and peripheral neuropathies are the commonest sequelae of diabetes mellitus. IC is the experiencing of pain in legs, especially calf muscles, during walking which is mainly attributable to peripheral arterial disease (PAD), an atherosclerotic condition that can provoke symptoms of leg pain during exercise. PAD results in diminished blood supply to the leg muscles culminating in pain due to lack of oxygen to the area. Peripheral arterial disease is a common manifestation of atherosclerosis, its prevalence increases with age and the presence of cardiovascular risk factors.^{1,2} PAD is common among people with type 2 diabetes in Pakistan.³ Because PAD is often observed with co-morbid conditions such as hypertension, dyslipidemia, diabetes mellitus (DM), cigarette smoking, and/or physical inactivity, the pathophysiology of PAD is certainly complex.⁴ Intermittent claudication in diabetes mellitus is commonly associated with arterial disease but may occur without obvious signs of peripheral circulatory impairment. Intermittent claudication in diabetics may be caused by chronic exertional compartment syndrome (CECS) of the legs.⁵ CECS is an under-diagnosed cause of chronic exertional leg pain which

is caused by increased intra-compartmental pressure within a fascial space; however, the mechanism of why pain occurs is unknown.⁶ Diabetes is the most common cause of neuropathy in United States and neuropathies are the most common complication of diabetes mellitus, affecting up to 50% of patients with type 1 and type 2 diabetes mellitus. Symptoms usually include numbness, tingling, pain, and weakness.⁷ The prevalence of painful diabetic peripheral neuropathy (PDN) is about 20% in patients with type 2 diabetes and 5% in those with type 1.⁸ Diabetic neuropathies may be focal or diffuse.⁹

The current study was destined to know about the occurrence of complications in type 2 diabetes mellitus patients in Lahore, Pakistan.

MATERIAL AND METHODS

The study was conducted at the Department of Physiology, Shaikh Zayed Federal Post-graduate Medical Institute, Lahore, from 2008 to 2010. A total of 150 subjects aged ≥ 40 suffering from type 2 diabetes mellitus, were selected from the Diabetic Clinic, Cardiology Unit, and Biochemistry Department of the Institute. The subjects were equally divided into uncomplicated (males=32%, females=68%) and complicated (males=29%, females=71%) type 2 diabetes mellitus groups.

Patients on insulin therapy, with severe systemic disease or having a major surgery in the past 3 months were not included in the study. After approval from the Ethical Committee, informed consent of the patients was obtained and their blood samples were collected for blood glucose level and lipid profile. Blood pressures, ankle brachial index (ABI), Body Mass Index (BMI), and neurological symptoms of each patient were recorded consequently. The 'Edinburgh Claudication Questionnaire'¹⁰ was used to assess intermittent claudication. The blood pressure of each patient (arm and ankle) was recorded with sphygmomanometer and a hand held Doppler to calculate the ABI, the weight with a standard weighing scale in light clothes and bare footed and the height with a standard stadiometer. The BMI was calculated. The urine of each patient was tested for microalbuminuria to label him complicated type 2 diabetic patient or otherwise. The data were analysed using SPSS-16.

RESULTS

In both groups about 8% individuals experienced generalised pain and 3% felt numbness. The difference in both cases between the groups was not significant statistically ($p>0.05$). Tingling sensations in the uncomplicated group were experienced by no one, but 2.7% of the individuals in the complicated group complained about the symptom. However, the difference was not significant ($p>0.05$). Regarding intermittent claudication, in the uncomplicated group no patient was suffering from the problem, but 6.7% of the individuals in the complicated group reported the problem. Nevertheless, the difference was significant ($p<0.05$).

Table-1: Comparison of symptoms between the two groups of T2DM [n(%)]

Symptoms	Uncomplicated Group (n=75)	Complicated Group (n=75)	p
Generalized Pain	6 (8.0)	6 (8.0)	1.000
Numbness	3 (4.0)	3 (4.0)	1.000
Tingling	0 (0)	2 (2.7)	0.155
Intermittent Claudication	0 (0)	5 (6.7)	0.028*
Total	9 (12)	16 (21.33)	

*significant

DISCUSSION

Diabetes mellitus can be labelled as the mother of many unhealthy conditions including vascular and nervous events. PAD and neuropathies, the leading sequelae of diabetes, engages many of the diabetic patients when the disease progresses. PAD manifests itself mainly as intermittent claudication while neuropathies as pain, numbness, tingling and many others. The present study encompasses some of these symptoms of diabetes mellitus. A study revealed that

the prevalence of IC was nearly four times more common in females and three times more common in males with diabetes compared to non-diabetic participants.¹¹ Though we did not study the occurrence of IC in non-diabetics yet we found that none of the uncomplicated but 6.7% of the individuals in the complicated group developed the symptom. In our opinion this does not imply that the risk of developing IC in uncomplicated diabetics has been eliminated altogether. The reason may be many folds but one of the possible justifications might be the small size of the sample where many occurrences happen by chance. Symptoms of sensory neuropathy affect 30–40% of diabetic patients in the US men and women are affected equally.¹² In our study about 8% of the individuals in both groups reported generalised pain. In spite of the fact that the current study was not aimed at to investigate the cause of the pain yet we can reasonably presume the involvement of pain nerve fibres. In a study it was discovered that the mean tactile threshold of diabetic patients was significantly higher than that of non-diabetic subjects, although the difference between the two groups was small.¹³ In our study about 4% of individuals in both groups developed numbness (partial or total lack of sensation in a part of the body) which roughly coincides with this study. In our study, tingling (experiencing a slight prickling or stinging sensation) affected about 2.7% subjects of the complicated group but none of the uncomplicated group. One study demonstrated that despite extremely poor control of their diabetes, up to 50% of all diabetic subjects never develop symptoms of neuropathy, even after >20 years duration of diabetes. Conversely, some unfortunate subjects develop neuropathy soon after the onset of diabetes, even when glycaemic control is relatively good. These well-known observations implicate the involvement of factors other than glycaemia in the aetiology of diabetic neuropathy.¹⁴ These facts and the findings of our own study prove that the time of onset of diabetic complications cannot be deduced with certainty. While looking at our study, one of the first impressions seem to be the lower percentage of patients suffering from diabetic problems, and that too in the uncomplicated diabetics (which do not provide a true picture of the problem) but the number of victims may be much higher. We, in our study, studied clinically confirmed DPN patients but countless number of sub-clinical cases may exist. While comparing clinically undetectable and detectable sensorimotor polyneuropathy in type 2 diabetics, the authors of a study suggested that nerve conduction studies (NCS) is a more reliable tool for detection of diabetic sensorimotor polyneuropathy especially for the sub-clinical neuropathies. Hence,

routine NCS should be done on diabetics at least on yearly basis.¹⁵ Therefore; in our opinion enormous efforts must be spent on the earlier detection and prevention of diabetic complications.

CONCLUSION

The prevalence of complications particularly intermittent claudication in type 2 diabetics is more frequent compared to uncomplicated type 2 diabetes mellitus patients.

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Address for Correspondence:

Dr. Muhammad Ishaq, Department of Physiology, Bannu Medical College, Bannu, Pakistan.