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DETECTION OF SENSORY NEUROPATHY BY SEMMES-WEINSTEIN MONOFILAMENT IN ASYMPTOMATIC TYPE2 DIABETIC PATIENTS FOOT AND ITS PREVALENCE

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Abstract:

Objective: *To establish a clinically asymptomatic diabetic neuropathy using single-filament SW and correlating the frequency of sensory neuropathy with duration of diabetes.*

Study Design: *A cross sectional study.*

Place and Duration: *In the Endocrinology Department of Services Hospital, Lahore from September 2016 to September 2017.*

Methodology: *Well-known patients with Type 2 diabetes and no peripheral neuropathy were selected for study. The weight, BMI, size and diabetes mellitus duration were calculated and measured. The SW monofilament was pressed with sufficient pressure to bend for one second, perpendicular to the test zone. The SW monofilament test was performed by using the x2 test to compare the frequency with the gene. SW monofilament test was performed using the Kendall test, with bivariate correlation with posttreatment diabetes duration.*

Findings: *A total of 700 patients, 324 male and 377 female, were studied. In 14.4% of the patients, Asymptomatic neuropathy was noted. Male, average age was higher significantly (51.01 ± 8.90 versus 47.0 ± 9.04, p <0.0001), but BMI in female was low (24.4 ± 2 versus 8 versus 26.2 ± 4.2, P <0.0001). There was no correlation between asymptomatic neuropathy and duration of diabetes (P = 0.98).*

Conclusions: *In our diabetic patients asymptomatic neuropathy is common and is not associated with diabetes mellitus duration. Diabetics must be actively examined with monofilament SW for asymptomatic neuropathy.*

Key words: *Neuropathy, Semmes-Weinstein monofilament, Diabetes mellitus.*

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INTRODUCTION:

Diabetes mellitus is a syndrome with inappropriate hyperglycaemia and irregular metabolism. Type 2 diabetes mellitus is the most common diabetes type. In D.M defective insulin secretion and Insulin resistance may occur. Initially Type 2 diabetics are not symptomatic. Late clinical diabetes presentation include multiple pathological complications such as macrovascular and microvascular complications and peripheral and cranial neuropathies. Diabetic peripheral neuropathy is a serious problem that affects half of diabetic patients during disease progression. Distal polyneuropathy symmetrically has a various incidence of approximately 31% in patients with diabetic foot and increases the risk of ulcer and amputation. Neuropathy was reported in 3% of patients and neuropathy in 10% of patients. Diabetes mellitus diagnosis later progress to neuropathy. Early peripheral neuropathy detection may decrease foot ulcers progression. Although neurotransmission studies are used as the gold standard, The International Diabetes Federation and the WHO have suggest Semmes-Weinstein monofilament (SW) 5.07 / 10 GM as a simple and useless method for the peripheral neuropathy detection in the primary care setting. Until now, there is no news from Pakistan about the frequency of neuropathy in asymptomatic diabetic patients.

MATERIALS AND METHODS:

This cross sectional study was held in the Endocrinology Department of Services Hospital, Lahore from September 2016 to September 2017. During examination, no symptoms of peripheral neuropathy are known to the informed type 2 diabetic patients were taken after taking. Patients are excluded from study having systemic diseases such as hypothyroidism, chronic renal failure, Gullian-Barr syndrome, alcohol poisoning, allergic contact dermatitis and vesicular dermatosis. Patients diagnosed previously with neuropathy were not included in the study. If patients met any of the given criteria are labeled as diabetic:

* In two different stages, Fasting blood sugar> 126 mg / dL.
* 2hours after oral glucose tolerance test (OGTT) Blood sugar more than 200. The patient was marked hypertensive when the blood pressure was greater than 135/85 mm Hg. The age, sex, and duration of the diabetes of the patient were noted. A detailed examination of patients clinically was performed. The patient's weight, size and B.P were noted. Monofilament test procedure SW: 5.08 filament foot protector sense standard medical examination was considered as the minimum level. The repeatable buckling tension required for filament bend is 10 grams force. It is considered "nonsensical" not to detect a force of 10 g. The foot examined was cleaned with alcohol. The SW monofilament is pressed with sufficient pressure for 1 second to bend filament perpendicular to the test zone. The test was applied in the following areas; the dorsal surface of the foot between the 1st and 2nd fingers, the 1st, 3rd and 5th fingers, the 1st, 3rd and 5th metatarsal head, lateral and medial heel mediopunte and the randomly placed test floor. In the proforma results were noted.

The sample size is calculated as 571. weight, Age, BMI, height, systolic pressure and diastolic pressure were compared between the sexes by the "t" test of the student. The frequency of hypertension among the sexes and the SW monofilament test were measured using the X2 test. Data asymmetry about the duration of diabetes was therefore reported in a median ± quarter interval (IQR) and compared with the Mann-Whitney U test. P value was <0.05. For analysis, SPSS version 18.0 was used.

RESULTS:

700 total patients meeting the inclusion / exclusion criteria were selected. Among these 325 (47.03%) were male and 377 (54.07%) were female. The average age of the male ± SD was 51.04 ± 8.0 years and it was 47.01 ± 9.04 years in women. The average age of women was lower significantly (p <0.0001, 95% CI: 2.4 to 5.0) than males using the student's "t" test. All selected patients average weight was 65.05 ± 9.92 kg, while the mean weight of male and female was 66.99 ± 9.0 kg and 62.0 ± 11.01 kg, respectively. The females average weight was lower significantly than males. Similarly, the females average height is lower significantly. All patients were 160.0 ± 9.05 cm in length, 167.04 ± 5.6 cm in males and 153.8 ± 5.8 cm in women. Although the average weight and height of women were lower, the mean BMI was significantly higher in women. The patients mean BMI was 26.04 ± 3.8, 23.99 ± 3.08 of males and 26.2 ± 4.3 of males. The males mean systolic pressure was 131.01 ± 17.01 mm Hg, while 133.5 ± 17.02 mm Hg in women, the difference being significant statistically. P = 0.165, 95: female 88.0 ± 12.1 mm Hg (test, 't' is not statistically significant compared to men with mean diastolic pressure difference of 86.7 ± 11.1 mm Hg%: -3.01 to 0.6). In 312 (44.6%) patients Hypertension was present; 129 of them (43.03%) were male and 184 (57.87%) were female. In women Hypertension was common. The mean duration of diabetes + IQR in males was 56.91 ± 43.99 months, while it was 59.06 ± 44.07 months in females. The difference in diabetes mellitus duration between genders was not significant statistically. (Mann-

Whitney U test: P = 0.565). (Table I).

Table-I: Comparison of Demographic Data of Studied Patients by Gender

Variables	*Gender*				
	Male		*Female*		*P value*
	Mean	*±SD*	*Mean*	*±SD*	
Age (yrs)	50.4	9.0	46.7	8.4	<0.0001
Weight (kg)	67.4	8.9	61.9	10.6	<0.0001
Height (cm)	166.4	5.5	153.8	5.8	<0.0001
Body Mass Index	24.4	2.8	26.2	4.2	<0.0001
Systolic Pressure	130.1	16.1	132.6	16.7	0.045
Diastolic Pressure	86.7	11.1	88.0	12.1	0.165
DM Duration (months)	57.1	44.1	58.6	43.7	0.565

SW monofilament test was meaningless in 101 (14.4%) of 41 patients (40.6%) and 60 (59.4%) females. When analyzed by the X2 test, the difference in insensitive frequency did not show a significant difference in frequency between sexes. There was no correlation between duration of diabetes and insufficient outcome per monofilament SW (p = 0.995).

DISCUSSION:

Peripheral neuropathy was highly prevalent in 14.4% of diabetic patients without any symptoms. Monofilament SW has previously been approved to detect neuropathy. Central, Autonomic, multifocal motor neuropathies and optic are documented and asymptomatic. In the diabetic patients foot, asymptomatic neuropathy Detection is important for better treatment and care of the feet, sensitive to complications and amputations in diabetic patients. The frequency of stupidity between both sexes was not the reason why they were equally sensitive to both sexes. The weight and height of males were higher significantly than females, but the body mass index of females was higher significantly. Lower extremity amputations are more common in patients with altered glycemic control and have been shown to significantly reduce the incidence of amputation in the lower extremities by regulating the legs regularly. SW monofilament tests can detect these patients before they become symptomatic, so foot care can be started before foot complications occur, and others have found the term silent neuropathy in such cases. It also affected equally in older adults in diagnosis of neuropathy. A study from Karachi showed that diabetic complications are more frequent in those with diabetic control failures and blood pressure and those with hyperlipidemia. Another important finding in our study was the absence of neuropathological correlations found in diabetic asymptomatic patients.

CONCLUSION:

Neuropathy is common in asymptomatic diabetics, who can be easily detected by SW monofilament test, and asymptomatic neuropathy has no correlation with diabetes duration.

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