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Diabetic Peripheral Neuropathy and Impotence: A Cross-Sectional Analysis

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Abstract:

Objective:

To observe the association of Impotence in patients with type 2 Diabetes Mellitus presenting with peripheral neuropathy.

Methodology:

The Department of Medicine at Benazir Bhutto Hospital in Rawalpindi conducted this cross-sectional study between May 2023 and June 2024. Upon obtaining written informed consent, all male participants with type 2 diabetes who were diagnosed with peripheral neuropathy and aged between 35 and 65 were included in the study. To diagnose and gauge the severity of erectile dysfunction, the local language version of the IIEF-5 questionnaire—Urdu—was utilized. The data analysis was done using SPSS version 20.

Results:

A total of 112 males with type 2 diabetes were recruited in this study. The mean age was 59.25±5.12 years, the mean diabetes duration of 9.9±4.81 years, and the mean HbA1c was found 9.01±2.10% respectively. The mean IIEF-5 Score was 12.41±5.99 and in regard to the severity of Impotence among study participants, 28(19%) fell in severe erectile dysfunction, 21(18%) in moderate erectile dysfunction, and 34(30.7%) in moderate to mild erectile dysfunction. Impotence status showed a statistically significant association with an increase duration of diabetes having p-value of <0.05, whereas age and HbA1c revealed a statistically insignificant association.

Conclusion:

When type 2 diabetic individuals with peripheral neuropathy manifest, Impotencies common among them. To confirm the study's conclusions, further extensive, community-based research will be needed.

Keywords: Peripheral neuropathy, Impotence, type-II diabetes.

Introduction:

Patients who have type 2 diabetes mellitus (PWD) are comparatively more likely than those who do not to experience Impotence. [1] Though underappreciated, Impotence is thought to be a common problem among PWD. [2] The review study demonstrates that the prevalence of Impotence ranges from 35% to 90% in individuals with type 1 and/or type 2 DM, while the prevalence of diabetic neuropathy is approximately 30%. [3] Furthermore, compared to individuals without diabetes, PWDs had almost three times the likelihood of developing Impotence, with the onset of Impotence occurring 10 to 15 years sooner. [4,6] Moreover, Impotence in PWD has been found to be more severe, linked to a lower quality of life, and less responsive to medical treatment. [5]

Decreased touch sensitivity is a hallmark of long fibre peripheral polyneuropathy, which is a neurologic disorder that is also common among people with disabilities (PWDs). A high risk of cardiovascular disease and associated risk factors, particularly diabetes, are highly correlated with Impotence [7], which also shares neurological [3] and microvascular [4] aetiologies. [8] The increased prevalence of Impotence is linked to a number of risk factors, including aging, having diabetes for a longer period of time, having poor glucose control, being obese, and developing microvascular problems in PWD. [3] Numerous investigations have demonstrated a clear positive correlation between Impotence, diabetic neuropathy, and attention deficit disorder [7,9–10]. Furthermore, a study including 1118 individuals with diabetes revealed a favourable correlation between ED and leg-related symptoms of the disease, while a separate investigation found a significant correlation between Impotence and the absence of the Achilles tendon reflex [11–12].

Nonetheless, our region has very little epidemiological information about the connection between diabetic peripheral neuropathy and Impotence. So, at a tertiary care hospital in Rawalpindi, we set out to see how frequently patients with type-II diabetes who also presented with peripheral neuropathy had erectile dysfunction.

Methodology:

This cross-sectional study was carried out at Department of Medicine, Benazir Bhutto Hospital, Rawalpindi, Pakistan from May 2023 to June 2024. All Males with type 2 diabetes having age of 35-65 years, diagnosed with peripheral neuropathy were included in the study. The international index of Impotence-5 (IIEF-5) questionnaires was used in the local language (Urdu version) to diagnose and assess the severity of impotence. [13]

IIEF-5 is the 5 items/Questions scale that could be utilized as part of the evaluation of erectile dysfunction. These Items are scored in 1–5 Likert-type scale, with higher scores indicating better erectile function. Minimum score 5-7: shows severe Impotence to maximum score 22-25: No erectile dysfunction. These items focused on five factors: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction.

All demographic details and relevant history including duration of diabetes, smoking habits, ischemic heart diseases, and chronic kidney disease were taken. A detailed examination was done and the Body mass index (BMI) was calculated. The laboratory investigation results and impotence scorings were recorded in a pre-designed questionnaire without a breach of confidentiality.

Data was analyzed using SPSS version 20. Continuous variables were presented as mean ± standard deviation whereas categorical variables were presented as frequency (percentage). Chi-squared test and one-way ANOVA were applied to determine the association between groups. P-value <0.05 considered as statistically significant.

Results:

A total of 112 males with type 2 diabetes were recruited in this study. The mean age was 59.25±5.12years, the mean duration of diabetes was9.9±4.81 years, and the mean HbA1c 9.01±2.10% respectively. Their baseline characteristics are shown in table 1.

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Table 1: Characteristics of study participants:

Parameters	Mean ± SD or n (%)
n=112	
Age (years)	59.25±5.12
Height (cm)	172±9.6
Weight (kg)	81±11.9
BMI (kg/m^2)	21.72±4.99
Duration of DM (years)	9.9±4.81
HbA1c (%)	9.01±2.10
Creatinine (mg/dL)	1.35±0.53
LDL (mg/dL)	89±31.1
Hypertension	
No	52(48.7%)
Yes	60(51.3%)
Stroke	
No	111(99.1%)
Yes	1(0.9%)
Coronary artery disease	
No	109(97.4%)
Yes	3(2.6%)
Renal disease	
No	105(92.2%)
Yes	7(7.8%)
Smoking	
No	93(80%)
Yes	19(20%)
Treatment taken for erectile dysfunction	
Advised to Visit ED Clinic	4(2.6%)
Device advised, not used by patient.	2(0.9%)
Not Taken sildenafil	102(89.5%)
Took Sildenafil	10(7%)
IIEF-5 Score	12.41±5.99

In regard to the severity of Impotence among study participants, 28(19%) fell in severe Impotence, 21(18%) in moderate Impotence, and 34(31.7%) in moderate to mild Impotence as shown in table 2.

Table 2: Categorization of Impotence

N	112
Severe Impotence	28(19%)
Moderate Impotence	21(18%)
Moderate to mild Impotence	34(31.7%)
Mild Impotence	15(16.3%)
No Impotence	14(15%)

Impotence status showed a statistically significant association with an increase duration of DM having p-value of <0.001, whereas age and HbA1c revealed a statistically insignificant association as depicted in table 3.

Table 3: Relationship of Impotence status with age, HbA1c, and duration of DM:

Parameters	Severe Impotence	Moderate Impotence	Moderate to Mild Impotence	Mild Impotence	No Impotence	P-value	Overall
n	28	21	34	15	14		112
Age (Years)	53.6±7.44	51.9±7.44	48.8±7.56	52.3±6.3	48.8±5.71	0.067	59.2±5.12
HbA1c	9.27±2.23	8.3±1.28	8.5±1.79	8.71±2.1	9.4±2.22	0.235	9.01±2.10
Duration of DM (years)	13.8±7.91	10.3±5.61	8.79±5.54	7.32±5.96	5.67±4.95	<0.001	9.9±4.81

Data presented as mean ± SD; P-value<0.05 considered to be statistically significant

Discussion:

According to the degree of Impotence, one-fifth of study participants had severe Impotence, another-fifth had significant Impotence, and nearly two-thirds had moderate to mild Impotence. The mean IIEF-5 Score in this study was 12.41±5.99. Age and HbA1c indicated a negligible correlation with the length of diabetes, whereas Impotence status showed a substantial correlation.

The results of another study indicated that the mean age of the age group in this study was 54.0 ±8.9 years, whereas the mean age of this study was 59.2±5.12 years.1Analyzing 145 research, the mean age of the 88 577 men was reported to be 55.8 ± 7.9 years. Fourth, the results of our investigation are consistent with another study, which found a mean age of 49.38 ± 9.52 years. [7] In this study, the average time spent with diabetes was 9.9±4.81 years, but in another, the median time spent with the disease was 6 years. [6] Corresponding to this, the DOGO study's participants had an average of 8.3± 7.2 years with diabetes. [2]

In our study, the average HbA1c was 9.01±2.10. This result is in line with another study that found an average HbA1c of 8.4± 2.1%. [1] First of all, A third of the subjects in another study, on the other hand, had well-controlled glycaemic status with a HbA1C of less than 7%, and their mean HbA1C was 7.94±2.31%. [7]

The study participants had a mean IIEF-5 Score of 12.41±5.99, with 28 (19%) having severe Impotence, 21 (18%) having moderate Impotence, 34 (31.7%) having moderate to mild Impotence, and 15 (16.3%) having mild Impotence. Only 14 (15%) had no Impotence. Prevalence of mild and mild to moderate Impotence, moderate Impotence, and severe Impotence were found in the published study to be 34%, 25%, and 20%, respectively, and the mean IIEF-5 Score was 15.42±5.86, which is similar to our study results. [7-8,20]

The results of this study indicate that there is a high correlation between age and IIEF 5 score, and that Impotence status exhibited a statistically significant link with increasing age. [7,16–17] On the other hand, the current study found no significant correlation between HbA1c and the length of diabetes. This runs counter to other studies that demonstrate a substantial correlation between the length of diabetes (measured by the IIEF 5) and HbA1c; individuals with poorer glycaemic control and those with longer diabetes duration were found to have more severe impairment. [3, 18–19]

Conclusion:

Among people with type-II diabetes, especially those who also have peripheral neuropathy, impotencies an extremely common condition. Nerve damage is a common feature of this disorder, which is linked to long-term diabetes. Complications can affect other body processes, including sexual health. The development of Impotence in these people may be greatly influenced by peripheral neuropathy, as it impairs nerve signalling. This population requires extensive management techniques due to the high frequency of Impotence in this subgroup, which highlights the intricate relationship between diabetes-related comorbidities and sexual dysfunction.

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