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Original Research Article

Prevalence of Peripheral Neuropathy in Type 2 Diabetes Mellitus: A Retrospective Study

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Conflict of interest: Nil

Abstract:

Background: Diabetes mellitus is defined by elevated blood glucose levels. The incidence of type 2 diabetes surpasses that of type 1. Diabetic peripheral neuropathy (DPN) is the predominant and problematic consequence of diabetes mellitus. It impacts about fifty percent of individuals with diabetes and deteriorates the patient's quality of life. This study aims to ascertain the prevalence of peripheral neuropathy and concomitant pain in individuals with diabetes mellitus.

Methods: This was a cross-sectional study conducted over a period of 2 years. Patient's ≥30 years with confirmed diagnosis of diabetes mellitus were included in the study. Patients with type 1 diabetes, gestational diabetes, and patients with illness such as vitamin B12 deficiency, chronic kidney disease, hypothyroidism were excluded from the study. Relationships between peripheral neuropathy and clinical factors were evaluated using the chi-square test and Student's t-test. A p-value of less than 0.05 was deemed statistically significant.

Result: The overall prevalence of DPN was found to be 36% have painful symptoms. A significant association of DPN was observed with the duration of diabetes ($p = 0.01$). The neuropathy was associated hypertension, duration of diabetes (>10 years), and HbA1c (>8.6%) was found to be positively associated the painful DPN.

Conclusion: The present investigation identified a substantial prevalence of diabetic peripheral neuropathy (DPN), substantially correlated with the duration of diabetes, inadequate glycemic management, and nephropathy.

Keywords: Diabetes complications, Diabetic neuropathy, DPN, T2DM, glycemic management

Introduction

Type 2 diabetes mellitus (T2DM) constitutes a significant global public health issue and is linked to many chronic microvascular and macrovascular problems [1]. Diabetic peripheral neuropathy (DPN) is a prevalent and debilitating consequence, resulting in discomfort, sensory impairment, foot ulcers, infections, and an elevated risk of lower-limb amputations [2]. Peripheral neuropathy substantially impacts quality of life and leads to heightened healthcare utilization. The incidence of diabetic peripheral neuropathy significantly varies based on the examined population, length of diabetes, glycemic regulation, and employed diagnostic criteria [3]. Prompt identification of neuropathy is crucial for appropriate treatments and the prevention of consequences. Retrospective investigations of hospital data can yield significant insights into the prevalence of neuropathy and its related risk factors in standard clinical practice. This study aimed to ascertain the prevalence of peripheral neuropathy in individuals with type 2 diabetes mellitus and to examine its correlation with specific clinical and metabolic parameters during a two-year duration.

Materials and Methods

Study Design and Setting: This retrospective observational study was performed in the outpatient and inpatient departments of Patna medical college and hospital over a duration of two years. Approval was secured from the institutional ethics committee prior to the commencement of data collection.

Study Population: 100 individuals with type 2 diabetes mellitus had their medical records examined.

Inclusion Criteria

- Patients aged ≥30 years

- Diagnosed cases of type 2 diabetes mellitus
- Duration of diabetes ≥1 year
- Complete medical records available

Exclusion Criteria

- Type 1 diabetes mellitus
- Gestational diabetes
- Patients with neuropathy due to other causes (alcoholism, vitamin B12 deficiency, chronic kidney disease, hypothyroidism)
- Incomplete or missing records

Data Collection: The collected data encompassed demographic information, diabetes duration, glycemic control (HbA1c), treatment mode, presence of comorbidities including hypertension and dyslipidemia, and records of peripheral neuropathy. Peripheral neuropathy was identified using clinical symptoms, neurological examination, and available documented nerve conduction investigations.

Statistical Analysis: Data were evaluated utilizing conventional statistical software. Continuous variables were represented as mean ± standard deviation, whereas categorical variables were denoted as frequencies and percentages. Relationships between peripheral neuropathy and clinical factors were evaluated using the chi-square test and Student's t-test. A p-value of less than 0.05 was deemed statistically significant.

Results

Table 1: Baseline Characteristics of Study Population (n = 100)

Variable	Mean ± SD / n (%)
Mean age (years)	52.4 ± 9.5
Male	56 (56%)
Female	44 (44%)
Mean duration of diabetes (years)	8.2 ± 4.4
Mean HbA1c (%)	8.6 ± 1.6
Hypertension	66 (64%)
Dyslipidemia	52 (52%)

Table 2: Prevalence of Peripheral Neuropathy

Neuropathy Status	Number of Patients	Percentage
Peripheral neuropathy present	36	36%
Peripheral neuropathy absent	64	64%

Table 3: Association of Peripheral Neuropathy with Clinical Variables

Variable	Neuropathy Present (n = 36)	Neuropathy Absent (n = 64)	p-value
Mean age (years)	58.2 ± 8.6	56.7 ± 9.8	<0.01
Duration of diabetes >10 years	23 (55.3%)	16 (22.6%)	<0.01
Mean HbA1c (%)	8.7 ± 1.5	7.5 ± 1.4	<0.01
Hypertension	26 (74.7%)	34 (56.8%)	0.04

Discussion

This retrospective analysis reveals a significant prevalence (38%) of peripheral neuropathy in patients with type 2 diabetes mellitus. This data aligns with earlier studies indicating prevalence rates between 30% and 50%, contingent upon demographic factors and diagnostic techniques [4]. Advanced age, prolonged diabetes duration, and inadequate glycemic management were substantially correlated with the occurrence of peripheral neuropathy in this study. Chronic hyperglycemia induces metabolic and microvascular alterations that cause nerve ischemia and axonal injury, elucidating the significant correlation between increased HbA1c levels and neuropathy [5].

The increased incidence of neuropathy in patients with prolonged diabetes duration highlights the necessity for early diagnosis and continuous glycemic regulation [6]. The correlation with hypertension indicates that accompanying vascular risk factors may exacerbate nerve injury [7]. The study's retrospective design and dependence on recorded clinical diagnoses are drawbacks; still, the findings accurately represent real-world clinical practice.

Conclusion

Peripheral neuropathy is a prevalent consequence in individuals with type 2 diabetes mellitus, impacting about one-third of participants in this study. Advancing age, prolonged diabetes duration, inadequate glycemic regulation, and related comorbidities were significant predictors of neuropathy. Consistent monitoring for neuropathy and proactive control of hyperglycemia and cardiovascular risk factors are crucial to diminish

morbidity and avert long-term consequences. Further evaluation is needed through prospective research utilizing established diagnostic criteria.

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