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Correlation of Motor Nerve Conduction Velocity of Tibial Nerve and Peroneal Nerve with Glycemic Control and Duration of Diabetes Mellitus in Neurologically Asymptomatic Patients with Diabetes Mellitus Type 2

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ABSTRACT

INTRODUCTION: Diabetes mellitus (DM) is a growing global health concern. One of its major complications is diabetic peripheral neuropathy (DPN), often presenting subclinically before symptoms appear. Nerve conduction studies (NCS) are widely used for early detection of nerve abnormalities. Since peripheral nerves have regenerative potential, early diagnosis and timely intervention can reduce long-term complications. While many studies focus on sensory nerve involvement in DM, limited data exist regarding early motor nerve changes in asymptomatic individuals.
AIM: This study aimed to assess the correlation between nerve conduction velocity (NCV) and glycemic control (HbA1c) as well as the duration of diabetes in neurologically asymptomatic type 2 DM patients.
METHEDOLOGY: A total of 47 patients aged 31–60 years of both genders were included. Motor NCS parameters—distal latency, amplitude, and NCV—of the tibial and peroneal nerves were evaluated using the Medicaid Neurostim device. Data analysis was done using SPSS version 20.0. Normality was assessed using the Shapiro-Wilk test, and non-parametric tests were applied due to the non-normal distribution of most variables. Spearman's rho was used for correlation analysis.
RESULT: Results revealed a significant positive correlation between distal latency and both HbA1c and duration of DM. A significant negative correlation was found between motor NCV and HbA1c, as well as between amplitude and both HbA1c and disease duration.
CONCLUSION: In conclusion, NCS parameters can effectively detect early motor nerve involvement in asymptomatic type 2 DM patients. This highlights the importance of routine screening to predict and prevent future complications of diabetic neuropathy.

Keywords: Motor Nerve Conduction Velocity, Tibial Nerve, Peroneal Nerve, Asymptomatic Patients with Diabetes Mellitus Type 2, Glycemic Control.

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder marked by chronic hyperglycemia due to impaired insulin secretion, action, or both. It is classified into four types: type 1, type 2, gestational, and other specific types,

with type 2 DM accounting for 90–95% of cases[1,2]. Globally, diabetes prevalence was 9.3% in 2019, projected to rise to 10.9% by 2045. In India, type 2 DM prevalence ranges from 1.9% to 25.2%. In Gujarat, it is 7.1%, and in Raysan village (Gandhinagar), 1.27% [3,4,5,6,7]. Insulin dysfunction leads to peripheral nerve damage, causing symptoms like pain, numbness, or tingling[8]. Nerve damage in diabetes raises the risk of microvascular complications like neuropathy and foot injuries[9]. Nerve conduction studies (NCS) help detect and monitor peripheral nerve disorders, even in subclinical stages[10]. They assess sensory, motor, or mixed nerves via electrical stimulation and record responses[11]. Motor NCS involve stimulating a nerve and recording from a muscle it supplies. The response, a compound muscle action potential (CMAP or M wave), reflects the summed activity of motor units. These studies assess anterior horn cells, roots, peripheral nerves, neuromuscular junctions, and muscles. Motor NCS are key for identifying early nerve changes in diabetic patients[12].

Motor NCS Settings: Sensitivity: 2–5 mV/division, Sweep speed: 2–5 ms/division, Filters:
2 Hz – 10 kHz[12]

NEED OF THE STUDY: Diabetes, especially with neuropathy, can cause motor impairments such as poor balance, altered gait, increased body sway, and a higher risk of falls and injuries. These motor issues stem from disruptions in sensorimotor control, which involves the peripheral nervous system. While sensory neuropathy in diabetes is well-studied, motor nerve involvement remains underexplored—particularly in patients without visible neurological symptoms. Factors like poor glycemic control, obesity, sedentary lifestyle, and longer diabetes duration contribute to nerve changes. Research on motor nerve conduction in asymptomatic diabetics is limited, making it important to study how blood sugar levels and diabetes duration affect motor function. Early detection can help prevent these silent motor deficits from progressing into serious complications.

Aim: To evaluate the correlation between motor nerve conduction velocity (MNCV) of the tibial and peroneal nerves with glycemic control and duration of type 2 diabetes in neurologically asymptomatic patients.

Objectives: 1) To assess the relationship between tibial nerve MNCV and glycemic control. 2) To assess the relationship between peroneal nerve MNCV and glycemic control. 3) To assess the relationship between tibial nerve MNCV and diabetes duration. 4) To assess the relationship between peroneal nerve MNCV and diabetes duration.

MATERIALS & METHODS

Ethical Approval: The study was started after taking approval from institutional ethical committee

Study Settings: C M College of physiotherapy, Gandhinagar

Study Type: An observational study

Sample Selection: Patients were selected as per inclusion and exclusion criteria.

Sampling Size: 47 participants, in a study by Hamid et al.[13], it was observed that there was a negative correlation between HbA1c and NCV ($r=-0.4$, $p < 0.05$) and negative correlation between the duration and amplitude ($r=-0.35$, $p < 0.05$). In the present study, expecting to get similar results with 80% power, 95% confidence levels and considering population correlation as $r= 0.4$, the study requires a minimum of 47 subjects.

Sampling Technique: convenient sampling method

Duration of Study: 1.5 year

SELECTION CRITERIA:

Inclusion Criteria

Patient with age between 31-60 years, both male and female included, Patient diagnosed

with diabetes mellitus by physician >5 years, Patient must have recent HbA_1C report with last three months, Patients with no signs and symptoms suggestive of peripheral neuropathies

Exclusion Criteria

Patients diagnosed with type I diabetes mellitus, Patients with local injuries/lesions at the recording sites that may interfere electrophysiological study, Patients diagnosed with neuromuscular transmission disorders like myasthenia gravis, Patients diagnosed with lumbosacral pathology, radiculopathies, Smoking or Alcoholic patient, Patients diagnosed with metabolic or endocrine disorders hypo or hyper thyroidism etc.

METHODOLOGY

Ethical approval was obtained from the Institutional Ethics Committee of CMPP, Gandhinagar. Diabetic patients were identified from the OPD records of C. M. Patel College of Physiotherapy. Participants were contacted telephonically and invited to participate in the study. To broaden outreach, informational flyers were distributed at Civil Hospital and shared on social media platforms. The entire study procedure was clearly explained to each participant, and written informed consent was obtained prior to inclusion in the study.

A total of 128 patients were approached for the study. Of these, 96 responded positively, but 38 declined to visit the study site. Among the remaining 58 who met the inclusion and exclusion criteria, 8 were excluded due to the absence of recent HbA1c reports.

Fifty patients were initially enrolled. However, 3 discontinued during evaluation due to intolerance to testing intensity. Thus, 47 patients completed the study. Patients who were excluded or dropped out were educated about their condition and the importance of complication prevention.

Data Collection Procedure

The study was conducted over 1.5 years at C. M. Patel College of Physiotherapy. All assessments were performed in the morning in a quiet room with only the researcher present. Sensory exams were conducted prior to testing. Nerve conduction studies (NCS) were performed in a supine position using a Medicaid Neurostim machine.

Electrodes were applied with transmission gel and secured with tape. Bilateral lower limb nerve conduction velocity (NCV) was measured. Supramaximal stimuli were used for optimal responses. The protocol was based on techniques from Preston DC and Shapiro BE[5] for nerve conduction studies. For investigation of motor nerve, tibial nerve and peroneal nerve selected.

TIBIAL MOTOR STUDY[14]

Patient Position: Supine, relaxed

Recording Site: Abductor hallucis brevis (AHB)

- G1: 1 cm proximal and 1 cm inferior to navicular prominence
- G2: Over metatarsophalangeal joint of great toe

Stimulation Sites:

- Medial ankle (posterior to medial malleolus)
- Popliteal fossa (mid-posterior knee)

Ground Electrode: Between recording and reference

Parameters[12]: Sweep speed: 3 ms/div, Sensitivity: 5 mV/div, Filters: 2 Hz–3 KHz

PERONEAL MOTOR STUDY[14]

Patient Position: Supine, relaxed

Recording Site: Extensor digitorum brevis (EDB)

- G1: On EDB muscle belly
- G2: Over MTP joint of little toe

Stimulation Sites:

- Anterior ankle (lateral to tibialis anterior tendon)
- Below fibular neck (1–2 fingerbreadths below fibular head)

Ground Electrode: Between recording and reference

Parameters[12]: Sweep speed: 3 ms/div, Sensitivity: 5 mV/div, Filters: 2 Hz–3 KHz

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS (statistical package for social science) software version 26.0 Prior application of statistical tests, data was screened for normal distribution. The normality of the data was done by using the Shapiro-Wilk test. Descriptive statistics of Hba1c, NCS parameter and duration of diabetes were summarized as mean and standard deviation. P value lesser than 0.05 were considered as statistically significant.

The Degree of Coefficient of Correlation was graded into[15]

Low (0.29 ≥ absolute value r ≥ 0.1)

Moderate (0.49 ≥ absolute value r ≥ 0.3)

Substantial (absolute value of r ≥ 0.5).

RESULT

The study was carried out to find the correlation of nerve conduction velocity with glycemic control and duration of diabetes in neurologically asymptomatic patients with diabetes mellitus type 2. The result of the correlation of nerve conduction velocity with glycemic control and duration of diabetes mellitus with age, gender, latency, amplitude and nerve conduction velocity in neurologically asymptomatic patients with diabetes mellitus type 2. The normality of the data was done by using the Shapiro-Wilk test.

Analysis of Age distribution

The table 1.1 showed the statistics age distribution of the 47 study subjects. Among the 47 subjects, the mean age of subjects was 52.15±5.55. The minimum of the subjects was 42 and maximum age was 60.

Table: 1.1 Age (in years) distribution of subjects

Subjects	Mean	SD
age	52.15	±5.55

Analysis of gender distribution

The table 1.2 shows the gender distribution of 47 subjects. Among the 47 subjects 42.6% males (N=20) and 57.4% females (N=27). The value of both score is stating that there is statistically significant difference between genders. Hence proving that the group are heterogenous between in male and female ratio.

Table: 1.2 Gender distribution of subjects

Gender	Subjects	Percent
Male	20	42.6
Female	27	57.4
Total	47	100.0

Analysis of HBA1c and Duration of DM:

The table 1.3 showed mean of HBA1c (%) was 8.20±2.08 and the mean of duration of DM (years) was 8.70±3.22. the minimum HBA1C value was 6.5 and maximum was 12.69. duration of diabetes is ranged from 5-15 years.

Table: 1.3 HBA1c and duration of DM

	Mean	SD
HBA1c (%)	8.20	±2.08
Duration of DM (years)	8.70	±3.22

CORRELATION BETWEEN MNCV AND HBA1c

This table 1.4 showed there were moderate significant negative correlation between HBA1C and MNCV in tibial nerve but peroneal nerve has more significant negative correlation between HBA1C and MNCV. Which suggest when increase severity of diabetes disease (HBA1C) MNCV value decreased.

Table: 1.4 Relation between MNCV AND HBA1c

	Spearman's rho	
	HBA1C	
	r value	P value
Rt tibial MNCV	-0.30	0.03
Lt tibial MNCV	-0.29	0.04
Rt peroneal MNCV	-0.49	0.01
Lt peroneal MNCV	-0.31	0.02

CORRELATION BETWEEN MNCV AND DURATION OF DM

Table: 1.5 Relation between MNCV AND HBA1c

	Spearman's rho	
	HBA1C	
	r value	r value
Rt tibial MNCV	-0.30	-0.30
Lt tibial MNCV	-0.29	-0.29
Rt peroneal MNCV	-0.49	-0.49
Lt peroneal MNCV	-0.31	-0.31

This table 1.5 showed there were low significant negative correlation between duration of DM and MNCV in tibial nerve and peroneal nerve. Which suggest when increase duration of DM (years) MNCV value decreased.

DISCUSSION

Type 2 diabetes mellitus (T2DM) is marked by insulin resistance, impaired insulin secretion, increased glucose production, and lipid metabolism disturbances. In early stages, pancreatic beta cells compensate to maintain normal glucose levels[16]. This study aimed to assess the correlation of tibial and peroneal nerve conduction with glycemic control and diabetes duration in neurologically asymptomatic T2DM patients. Nerve conduction studies (NCS) and HbA1c levels help identify the risk of diabetic peripheral neuropathy—a common microvascular complication that can lead to motor weakness, mobility issues, and non-healing foot ulcers, increasing the risk of gangrene and limb loss[17]. The findings may support early prevention of diabetic neuropathy.

AGE DISTRIBUTION

In this study, 47 patients were analyzed. Most participants (28 out of 47) were in the 51–60 age group, with a mean age of 52.15 ± 5.55 years. Studies by Ketul Suastika et al. and Szoke et al. report that aging reduces insulin sensitivity and beta-cell function, with insulin secretion declining about 0.7% annually[18]. Rohit Sharma et al. also found that individuals aged 51–60 are more prone to dietary irregularities and lack of exercise, contributing to metabolic disorders like type 2 diabetes[19]. Bhavesh P et al. reported the highest incidence of type 2 diabetes among individuals aged 31–60 years[20]. Onkar Nath R et al. found that 60.7% of patients aged 60 and above had diabetic peripheral neuropathy[21].

GENDER DISTRIBUTION

In this study, 42.6% of patients were male (N=20) and 57.4% were female (N=27). Rajendra P et al. also reported a higher prevalence of type 2 diabetes in females, though complications were more common in males[22]. Middle-aged women tend to have lower physical activity and poor dietary habits, and the menopausal transition leads to increased visceral fat and insulin resistance, making them more prone to diabetes[22]

HBA1C AND DURATION OF DIABETES MELLITUS

In this study mean of HBA1C is 8.20 ± 2.08. minimum HBA1C is 6.5 % and maximum HBA1C is 12.69%. Lee et al. in a previous study have reported that poor glycemic control (HbA1c > 6.5%) reflects the severity of polyneuropathy as well as increased risk for its occurrence in DM patients by more than 5 times[23].

In this study mean of duration of DM (years) is 8.70±3.22. Minimum duration of DM is 5 years and maximum is 15 years. Oras B et al. conducted study in which they found patient having impaired nerve conduction whom have > 15 years of DM and lesser risk found whom have <5 year of DM[24].

GLYCEMIC CONTROL AND MNCV PARRAMETERS

In the present study, a significant reduction in conduction velocity and amplitude, along with increased latency in the tibial and peroneal nerves in type 2 diabetes mellitus, may be attributed to hyperglycemia-induced metabolic and vascular changes. High blood sugar causes chemical alterations in nerves, impairs nitric oxide synthesis, and leads to

microvascular constriction, resulting in endoneurial hypoxia and nerve damage, which slows nerve conduction velocity (NCV) and decreases amplitude due to axonal degeneration[16]

Tavakoli et al. and Malik et al. highlighted that endothelial dysfunction, vascular narrowing, and reduced nutrient supply play a crucial role in neuropathy pathogenesis[25,26,27]. Bansal et al. observed that NCV declines at a rate of 0.5 m/s/year in diabetic neuropathy, and is associated with increased HbA1c levels, indicating axonal damage[28]. Thrainsdottir et al. showed that thickened basement membranes and reduced capillary areas also correlate with neuropathy severity[29].

Our findings align with studies by Grati et al[30]., Sabooh Saed et al[31]., and Kanavi Roopa et al.[32], who reported a negative correlation between HbA1c and NCV. Vishwanathan et al. found similar inverse correlations with sensory NCV[33]. Neelamba Prasad et al. emphasized that strict glycemic control is essential to prevent neuropathy in type 2 diabetics[34].

DURATION OF DM AND MNCV PARAMETERS

In this study found that nerve conduction velocity and amplitude were significantly reduced ($P < 0.05$) with increasing duration of diabetes. There was a strong correlation between longer diabetes duration and nerve conduction abnormalities. This decline is likely due to progressive nerve damage, as conduction velocity depends on myelin integrity and amplitude on the number of functional axons[35].

In our study, diabetes duration significantly affected tibial and peroneal nerve conduction, aligning with findings by Hamid et al., who reported reduced amplitude and conduction velocity in median nerves of Type 2 diabetic patients with longer disease duration[13].Similarly, Agarwal et al.[36] , Hussain et al.[37], Liu et al. [38] Mohapatra S et al. [39] reported progressive deterioration in nerve conduction with diabetes duration. K.

Munisekhar et al.[40] also observed significantly decreased conduction velocity in the common peroneal and posterior tibial nerves.

In this study there were peroneal nerve affect more compare to tibial nerve. According to Do Dinh Tung et al. they also found nerve damage was highest in the right peroneal nerve and left peroneal nerve (86.7%for both), followed by the right tibial nerve and left tibial nerve[41] (67.2% and 68.9%, respectively)

Our findings show that neuropathy severity, as measured by NCS, is influenced by both HbA1c levels and diabetes duration. Since HbA1c variability is a prognostic factor, maintaining stable and controlled blood glucose may help prevent further nerve damage. HbA1c can also serve as a predictor of neuropathy severity. These factors explain the changes in nerve conduction seen in diabetic patients.

LIMITATION OF THE STUDY

The study's limitations include the absence of a non-diabetic group. Additionally, in this study patients did not check for vitamin B12 deficiency and sensory nerve conduction studies and also did not check according to BMI.

FUTURE SCOPE OF THE STUDY

Future research should explore the impact of glycemic control and diabetes duration on both motor and sensory nerve conduction in patients with type 1 and type 2 diabetes. Studies should also consider factors such as obesity, age, and the duration of disease. Including a broader population—especially older individuals and those with longer-standing diabetes—will enhance understanding of how these variables influence nerve health. This can contribute to developing more effective strategies for preventing diabetic neuropathy across diverse patient groups.

CLINICAL IMPLICATIONS

The correlation between nerve conduction velocity, glycemic control, and diabetes duration in asymptomatic type 2 diabetic patients highlights the need for early detection of neuropathy risk. It emphasizes the importance of tight glycemic control and routine nerve function monitoring, even without clinical symptoms, to enable timely intervention and prevention.

CONCLUSION

This study demonstrates significant motor NCS changes in neurologically asymptomatic diabetic patients, with poor glycemic control and longer diabetes duration linked to reduced amplitude, slower MNCV, and increased latency. The peroneal nerve was more affected than the tibial nerve. Strict glycemic control may help reduce neuropathic risk, and NCS serves as a useful tool for early detection and prediction of diabetic peripheral neuropathy.

Declaration by Authors

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REFERENCES

1. Patil M, Dhruw AK, Gupta S. Study of clinical and nerve conduction study correlation in patients of diabetic neuropathy in diabetes mellitus type 2.
2. Banday MZ, Sameer AS, Nissar S. Pathophysiology of diabetes: An overview. Avicenna journal of medicine. 2020 Oct;10(04):174-88
3. Williams R, Karuranga S, Malanda B, Saeedi P, Basit A, Besançon S, Bommer C, Esteghamati A, Ogurtsova K, Zhang P, Colagiuri S. Global and regional estimates and projections of diabetes-related health expenditure: Results from the International Diabetes Federation Diabetes Atlas. Diabetes research and clinical practice. 2020 Apr 1; 162:108072
4. Atre S, Deshmukh S, Kulkarni M. Prevalence of type 2 diabetes mellitus (T2DM) in India: A systematic review (1994–2018). Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2020 Sep 1;14(5):897-906.
5. Anjana RM, Deepa M, Pradeepa R, Mahanta J, Narain K, Das HK, Adhikari P, Rao PV, Saboo B, Kumar A, Bhansali A. Prevalence of diabetes and prediabetes in 15 states of India: results from the ICMR–INDIAB population-based cross-sectional study. The lancet Diabetes & endocrinology. 2017 Aug 1;5(8):585-96.
6. Prajapati D, Kedia G. Prevalence of diabetes and its risk factors: a cross-sectional study in Ahmedabad, Gujarat. Int J Med Sci Public Health. 2016 Mar 1; 5:425-9.
7. Patel DK, Patel RR, Shah PA. Prevalence of Diabetes Mellitus in Raysan Village, Gandhinagar, Gujarat. India. J Pharm Sci Bioscientific Res. 2016;6(5):695-8.
8. Jwad SM, Neamah IM. Diagnosis of Diabetic Peripheral Neuropathy. Journal of Clinical/Pharmaco-Epidemiology Research. 2022 Jun 23;4(1):37-41
9. Sepat P, Wasnik S. Sensory nerve conduction study of median ulnar and radial nerves in type 2 diabetic individuals in the age group 40–80 years. Heliyon. 2020 Oct 1;6(10): e05318
10. Mahajan S, Makwana J, Khadayate P. Comparison of sensory nerve conduction in upper limb and lower limb in asymptomatic diabetics and normal volunteers. Int J Basic Appl Physiol. 2016;5(1):141.
11. Muley PA, Biswas DA, Taksande A. A pilot study investigating the effect of glycemic control on electrodiagnostic parameters in type ii diabetic patients. Journal of Pharmaceutical Research International. 2021 Jun 22;33(32B):146-53.
12. O'Bryan R, Kincaid J. Nerve conduction studies: basic concepts and patterns of abnormalities. Neurologic Clinics. 2021 Nov 1;39(4):897-917.
13. Hamid, Ahmed S, Osman A, Babiker R. Nerve conduction and its correlations with duration of diabetes mellitus and glycosylated haemoglobin in type 2 diabetes mellitus (T2DM). J Endocrinol Metabol Diab South Africa 2021; 26.
14. Preston DC, Shapiro BE. Electromyography and neuromuscular disorders e-book:

clinical-electrophysiologic correlations (Expert Consult-Online). Elsevier Health Sciences; 2012 Dec 1
15. Yajnik K, Ghugare BW, Dinkar M, Jain S, Chauhan H. Effect Of Age, Gender And Body Mass Index On Tibial And Peroneal Motor Nerve Conduction Study Variable". Int J Basic Appl Physiol. 2017;6(1):51.
16. Farheen A, Malipatil BS, Arif G. Nerve conduction in type 2 diabetics and its correlation with glycosylated haemoglobin. Journal of Evolution of Medical and Dental Sciences. 2015 Jan 19;4(6):1023-35.
17. Shaji RM, Abdullah M, Nagabushana D, Kulkarni A. Nerve conduction parameters and its correlations with glycemic control and duration in type 2 diabetes mellitus− A cross-sectional study. International Journal of Nutrition, Pharmacology, Neurological Diseases. 2023 Jul 1;13(3):181-7.
18. Suastika K, Dwipayana P, Semadi MS, Kuswardhani RT. Age is an important risk factor for type 2 diabetes mellitus and cardiovascular diseases. Glucose Tolerance. 2012 Dec 12; 5:67-80.
19. Sharma R, Prajapati PK. Rising risk of type 2 diabetes among inhabitants of Jamnagar, Gujarat: A cross-sectional survey. AYU (An international quarterly journal of research in Ayurveda). 2015 Jan 1;36(1):10-7.
20. Patel B, Patel C, Panchal D, Patel S. A retrospective evaluation of the trend of prevalence of type 2 diabetes mellitus in different age groups in a tertiary care hospital. Panacea J Med Sci. 2021; 11:130-3.
21. Rai ON, Mishra V, Chandra R, Saxena SK, Mangal BD. Diabetic Peripheral Neuropathy And Its Metabolic Determinants In A North Indian Population. National Journal of Integrated Research in Medicine. 2016 Mar 1;7(2).
22. radeepa R, Shreya L, Anjana RM, Jebarani S, Venkatesan U, Kamal Raj N, Swami OC, Mohan V. Sex-based differences in clinical profile and complications among individuals with Type 2 diabetes seen at a private tertiary diabetes care centre in India. InHealthcare 2023 Jun 2 (Vol. 11, No. 11, p. 1634). MDPI.
23. Lee WJ, Jang S, Lee SH, Lee HS. Correlation between the severity of diabetic peripheral polyneuropathy and glycosylated hemoglobin levels: A Quantitative study. Ann Rehabil Med 2016; 40:263-70.
24. Khudair AR, A Hamdan T, Kadhim Baqer O. The Factors That Influence On Nerve Conduction In Diabetic Patients. Basrah Journal of Surgery. 2015 Dec 28;21(2):7-13.
25. Al- Ani FS, Al- Nimer MS and Ali FS. Dyslipidaemia as a contributory factor I etiopathogenesis of diabetic neuropathy. Indian J EndocrinolMetab. 2011 Apr; 15(2):110-4.
26. Tavakoli M, Mojaddidi M, Fadavi H, Malik R.A. Pathophysiology and treatmentof painful diabetic neuropathy. Current Pain and Headache Reports. 2008; 12: 192 197.
27. Malik RA. The Pathology of human Diabetic neuropathy. Diabetes. 1997 Sep; 46(2): 50-53.
28. Bansal V, Kalita J, Mishra UK. Diabetic neuropathy. Postgrad Med J. 2006; 82: 95 100.
29. Thrainsdottir S, Mallik RA, Dahlin LB, Wiksell P, Eriksson KF, RosenI, et al. Endoneurial capillary abnormalities presage deterioration of glucose tolerance and accompany peripheral neuropathy in man. Diabetes. 2003 Oct; 52: 2615-22.
30. Grat R J, Halter J B, Pteiter M A, Halar E, Brozovich F, Prote D Jr., Glycemic control and nerve conducton abnormalities in Non-Insulin dependent diabetic subjects. Ann Intern med 1981:94; 307: 311.
31. Saboohi Saeed, Muhammad Akram, Qurat-Ul-Ai –Mahmood; Glycemic Control as a Predictor of Diabetic Neuropathy; Pakistan Journal of Medical and health sciences 2009, April _June issuehttp://pjmhsonline.com/glycacemic_control_as_a predict.
32. Kanavi Roopa, Shekharappa Srinivasa, K. J. Vedavathi, Giriyappa venkatesh; A Study on the utility of Nerve conduction Studies in type 2 Diabetes. Journal of Clinical and Diagnostic research June 2011 Vol 5 issue 3: 529-531
33. Vijay Viswanathan, Rajasekar Seena, Mamtha B. Nair, Chamukuttan Snehalatha, R. M. Bhoopathy, Ambady Ramachandran Neurology India December 2004 Vol 52 Issue 4: 466-469.
34. Neelambala Prasad, Indu K. Pisharody, M.S. Karandikasr, S.A. Diwanji, Pankaja R. Raghav; Comparative Analysis of Electrophysiological Parameters of Median

Nerve in Normal and Diabetic Subjects: Indian Medical Gazette; July 2013: 261 264.
35. Mallik A, Weir AI. Nerve conduction studies: essentials and pitfalls in practice. J Neurol Neurosurg Psychiatry 2005;76 Suppl 2: ii23-31.
36. Agarwal S, Lukhmana S, Kahlon N, Malik P, Nandini H. Nerve conduction study in neurologically asymptomatic Diabetic patients and correlation with glycosylated hemoglobin and duration of diabetes. Natl J Physiol Pharm Pharmacol 2018; 8:1533-8.
37. Hussain G, Rizvi SA, Singhal S, Zubair M, Ahmad J. Cross sectional study to evaluate the effect of duration of Type 2 diabetes mellitus on the nerve conduction velocity in diabetic peripheral neuropathy. Diabetes Metab Syndr 2014; 8:48-52.
38. Liu MS, Hu BL, Cui LY, Tang XF, Du H, Li BH (2005) Clinical and neurophysiological features of 700 patients with diabetic peripheral neuropathy. Zhonghua Nei Ke Za Zhi 44:173-176.
39. Mohapatra S, Lakra B, Satapathy U. Study on electrophysiological changes of peripheral nerves in type 2 diabetes mellitus. National Journal of Physiology, Pharmacy and Pharmacology. 2022;12(2): 140-5.
40. Munisekhar K, Parvathi G, Padmaja A, Boddeti RK. Effect of glycemic control on nerve conduction studies. Int. J. Biol. Med. Res. 2013;4(6).
41. Tung DD, Minh NN, Nguyen HT, Nguyen Thi PN, Nguyen Thi HL, Nguyen DL, Pham DT, Tran TQ, Nguyen DT, Nguyen LP. Lower Extremity Nerve Conduction Abnormalities in Vietnamese Patients with Type 2 Diabetes: A Cross-Sectional Study on Peripheral Neuropathy and Its Correlation with Glycemic Control and Renal Function. Journal of Personalized Medicine. 2023 Mar 31;13(4):617.

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