Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2014; 2(4C):1347-1350 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com **DOI:** 10.36347/sjams.2014.v02i04.039

Research Article

A Study of Clinical Profile of Peripheral Neuropathy in Diabetes Mellitus

Abhijeet A. Adgaonkar[1*], Dr. Anant A.Dawange[2], Dr. Shalaka A. Adgaonkar[3], Dr. V.G.Kale[4], Dr. Pravin P.Shekokar[5]

[1]Assistant Professor, Department of Medicine, Government Medical College, Akola, Maharashtra, India
[2]Assistant Professor, Department of Surgery, Government Medical College, Akola, Maharashtra, India
[3]Medical officer, District Women's Hospital, Akola, Maharashtra, India
[4]Associate Professor, Department of Medicine, Mahatma Gandhi Missions Medical College, Aurangabad, Maharashtra, India
[5]Assistant Professor, Department of Physiology, Government Medical College, Akola, Maharashtra, India

***Corresponding author**
Abhijeet A. Adgaonkar
Email: abhiadgaonkar@gmail.com

Abstract: Peripheral neuropathy is commonly caused by chronically high blood sugar in diabetes mellitus patients. Although pain or numbness in the legs or feet may be the most common complaint from people diagnosed with neuropathy, it is not the only symptom of this complication. Neuropathy can cause a host of different types of symptoms, depending on whether nerves in the legs, gastrointestinal tract, or elsewhere in the body are affected. The study was undertaken to study clinical profile of peripheral neuropathy in diabetes mellitus and to correlate it with various parameters. In this study total 50 diabetic patients were studied. The detailed clinical examination including sensory system examination was carried out in them. Different clinical parameters were studied in them. The most frequent complaint detected in the present study was tingling and numbness. The most frequent signs detected were impaired sense of vibration, impaired sensation and loss of ankle jerk. As the age increases, severity of peripheral neuropathy increases. It is also observed that, as duration of diabetes mellitus increases, the severity of peripheral neuropathy increases. The severity of peripheral neuropathy was found to be directly related with the levels of blood sugar. People with diabetes can reduce their risk of developing nerve damage by keeping their blood sugar levels as close to normal as possible.
Keywords: Diabetes mellitus, Peripheral neuropathy

INTRODUCTION

Peripheral neuropathy refers to the damage to one or more of peripheral nerves. Peripheral neuropathymay occur due to different conditions. Diabetes is the most common cause of persistent (chronic) peripheral neuropathy. The symptoms of peripheral neuropathy depend on the type of peripheral nerve involved (sensory, motor or autonomic nerves). It can affect any one, or a combination of all three types of nerves. The treatment for peripheral neuropathy is done to treat any underlying cause, to control symptoms.

Peripheral neuropathy is commonly caused by chronically high blood sugar [2]. Peripheral neuropathy due to chronically high blood glucose can be one of the most frustrating and debilitating complications of diabetes because it is associated with pain, discomfort and disability and also because available treatments are not uniformly successful. It leads to numbness, loss of sensation, and sometimes pain in feet, legs, or hands [3].

Taking diabetes as a risk factor, about half of people who have had diabetes for 25 years have peripheral neuropathy. About 60% to 70% of all people with diabetes will eventually develop peripheral neuropathy, although not all suffer pain. Yet this damage is not inevitable. Studies have revealed that people with diabetes can reduce their risk of developing nerve damage by keeping their blood sugar levels as close to normal as possible [1].

Aims and Objectives

The present study was undertaken

- To study profile of peripheral neuropathy in patients of diabetes mellitus.
- To see co-relation of diabetic peripheral neuropathy with various epidemiological factors.
- To assess severity of peripheral neuropathy clinically.

MATERIALS AND METHODS

The present study comprises study of profile of peripheral neuropathy in 50 patients of diabetes mellitus, attending indoor and outdoor departments. All the patients agreed to take part in the present study by giving their written consent. These cases include patients of both sex and different age group ranging from 20 to 70 years. They had varying duration of diabetes mellitus. Diagnosis of diabetes mellitus was made by symptoms, signs and estimating the blood sugar. The present study was done after prior permission from institutions local ethical committee.

A detailed history was taken in each case. The patients were particularly questioned to rule out factors which may cause peripheral neuropathy e.g. alcoholism ,metallic poisoning, Hensen's disease, deficiency conditions, syphilis and malignancy. The physical examination was carried out in detail. Clinical peripheral neuropathy due to reasons other than diabetes mellitus was excluded using questionnaire. The peripheral neuropathy disability was determined by presence of deep tendon reflex (DTR),decreased DTR & absent DTR sensations. Vibration perceptions threshold was tested by tuning fork (128 Hz) on each medial malleolus. Pain sensations tested by pinprick, touch sensation with wisp of cotton, temperature sensation by hot and cold water, position sense & DTR were also tested conventionally.

Diabetic patients having obvious liver disease, malignancy and leprosy were excluded from study. So also the patients having clinical evidence of renal involvement were also excluded. Patients with a history of taking alcohol, ayurvedic medicine and drugs like INH, excluded from study.

In this study peripheral neuropathy was diagnosed clinically with one or two of abnormalities of NSS & NDS. Hb estimation, TLC, differential count, Urine sugar and ketones, Kidney functions tests and LFT were tested in all the patients. ECG was done as per needed. The criteria taken for diabetes mellitus, is fasting > 110 and post meal > 140mg.

RESULTS

Following are the observations made out of this study.

Table 1: Age wise distribution of patients

Age	Male	Female	Total
21-30	03	07	10
31-40	03	02	05
41-50	13	05	18
51-60	08	03	11
61	03	03	06

Table 2: Incidence of peripheral neuropathy in symptomatic patients

Age	Total	No. of Males	Females	Total	Percentage
21-30	10	--	--	--	--
31-40	05	--	1	1	20
41-50	18	4	2	6	33.3
51-60	11	5	2	1	63.6
61& above	6	1	--	--	16.6
Total	50	10	5	15	--

In clinically symptomatic patients 30% of cases showed evidence of peripheral neuropathy. Maximum incidence was noted in age group of 51-60.

Table 3: Correlation of symptoms of peripheral neuropathy with duration of diabetes

Duration (in years)	Total cases	Males in Total cases	Males with peripheral neuropathy	Femalesi n Total cases	Females with peripheral neuropathy	Total cases of peripheral neuropathy	Percentage
1	08	03	--	5	--	--	--
2	08	05	--	03	--	--	--
3	09	05	--	04	1	1	11.1
4	07	4	--	03	--	--	--
5	03	2	1	01	--	01	33.3
6	06	05	03	01	01	04	66.6
>6	09	06	06	03	03	09	100.00
	50		33.%		25%		

Maximum incidence was noted where duration of diabetes was >6 years. Males having predominance compared to females.

Table 4: Correlation of symptomatic peripheral neuropathy with blood sugar levels

Blood Sugar (mg %)	Total cases	Peripheral Neuropathy present	Males	Females	Percentage
120-180	3	--	--	--	--
180-200	10	--	--	--	--
200-230	12	2	1	1	16.4
230-260	10	4	3	1	40
260-300	9	05	03	02	55
>300	06	04	03	01	66
	50	15	10	05	

Maximum incidence of peripheral neuropathy was noted in blood sugar >300 mg. None of the patients were symptomatic where blood sugar level was below 200 mg. Clinical symptoms of peripheral neuropathy are directly proportional to blood sugar levels.

Table 5: Common clinical features and signs in Diabetic patients

Complaints	No.ofCases	Percentage
Tingling &Numbness	15	30%
Impaired Vibrations	13	26
Impaired ankle jerk	12	24
Impaired touch sensation	09	18
Pain	08	16 %

DISCUSSION

In the present study, out of 50 cases studied, 30 were males& 20 were females. The age of patient varies from 21 to 70 years; maximum patients were in age group of 51 to 70 years.

Age incidence

The diabetic neuropathy is commonest after 5th decade of life. Behl *et al*.[4] demonstrated that middle age/elderly diabetic were generally more affected.

Shaw *et al*.[5] showed incidence of peripheral neuropathy was 17.6% between age group of 20-40 years and 56.8% between 40-70 years. Kasturi *et al*.[6] successfully done study on 100 patients and found incidence of peripheral neuropathy as 24% in age group 21-40 years & 58% in 40 to 70age group. Thus it is common that peripheral neuropathy in general occurs commonly in middle age and elderly diabetics.

Clinical incidence

In the present study, incidence of peripheral neuropathy was found to be 30% on clinical examination, the figure tallies with Kuruvilla *et al*.[7]. The variability may depend upon selection of cases. High age group, longer duration of diabetes is the predictor of severity of disease.

Blood Sugar levels

Maximum patients of peripheral blood sugar levels of fasting 200 to 220 &post mealmore than of 260 mg% showed the presence of peripheral neuropathy.

Behl*et al*.[4] in a study of 539 diabetic patients found direct correlation of severity of hyperglycemia with incidence of peripheral neuropathy. Partanen *et al*.[8] demonstrated rising incidence of peripheral neuropathy with increase of blood sugar levels.

Few workers like Dutta *et al*.[9] found incidence of peripheral neuropathy with blood sugar level in lower range of blood sugar level (fasting 197.2 + 57-67).

In the present study it was observed that severity of peripheral neuropathy was related with blood sugar. Higher the blood sugar level, severe is neuropathy.

Thus it can be concluded that peripheral neuropathy is common in diabetic & who has higher blood sugar levels. However the patients with lower blood sugar level have decreased incidence of peripheral neuropathy.

Duration of diabetes mellitus

In the present study neurological involvement were noted in relation to duration of diabetes mellitus. Kasturi *et al*.[6] also found the positive correlation between duration of diabetes mellitus and incidence of peripheral neuropathy. Present study very well matched with workers like Shaw *et al*.[5] and Kasturi *et al*. [6].

Symptoms of Diabetes

Common symptom of diabetic peripheral neuropathy is tingling and numbness which was found in 15 cases (30%) followed by impaired vibration 13(26%), impaired ankle jerk (24%),impaired touch sensation (18%) and pain sensation in 8 (16%).

CONCLUSION

In the present study ,the incidence of peripheral neuropathy was recorded as 30% on clinical examinations. The most frequent complaint detected in the present study was tingling and numbness. The most

frequent signs detected were impaired sense of vibration, impaired sensation and loss of the ankle jerk. On clinical examination, incidence of peripheral neuropathy in males was found to be 33% and in females it is 25% on clinical examinations, not a single case was observed in age group 21-30 yrs. As the age increases, severity of peripheral neuropathy increases. It is observed that, as duration of diabetes mellitus increases, the severity of peripheral neuropathy increases. With the increase of blood sugar, more cases of peripheral neuropathy were detected clinically. The severity of peripheral neuropathy was found to be a directly related with the levels of blood sugar i.e. blood sugar >300mg.

ACKNOWLEDGEMENT

Authors acknowledge the patients who agreed to participate in the present study. The present study was undertaken to submit the dissertation to appear for M.D. Medicine examination. Hence no funding was received from any external source. Author himself had borne whatever expenses are required.

REFERENCES

1. Peripheral Neuropathy. Available from http://www.patient.co.uk/health/peripheral-neuropathy-leaflet
2. Peripheral Neuropathy and Diabetes Available from http://www.webmd.com/diabetes/peripheral-neuropathy-risk-factors-symptoms
3. Diabetic neuropathy and low carbs. Available from http://forum.lowcarber.org/archive/index.php/t-198692.html
4. Bahl A,Khosla HL, Caroli RK; A study of the involvement of the nervous system with special reference to neuropathy in diabetes mellitus. Indian Med Gaz., 1967;24:53.
5. Shaw JE, Hodge AM, deCoruten M, Dowse GK, Gareeboo H, Tuomilehto J *et al*.; Diabetic peripheral neuropathy in Mauritius: Prevalence and risk factors. Diabetes Res ClinPract., 1998;43(2):131-139.
6. Kasthuri AS, Sofat MS, Kumar N; Somatic peripheral neuropathy in diabetes mellitus. MJAFI, 2000;56:33-36.
7. Kurivilla N; Thesis for M.D., Vellore, 1970.
8. Partanen J, Niskanen L, Lehtinen J, Mervaala E, Siitonen O, Uusitupa M; Natural history of peripheral neuropathy in patients with non-insulin dependent diabetes mellitus. New Engl J Med., 1995;333(2):89-94.
9. Dutta A, Naorem S, Singh TP, Wangjam: Prevalence of peripheral neuropathy in newly diagnosed type 2 diabetics. Int J DiabDev Countries., 2005;25:30-33.