RESEARCH

STUDY OF DIABETIC NEUROPATHY IN MAHARASHTRA POPULATION

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Corresponding Author:
Dr. Sayyed Sammiyodhin Gous,
Email: drsami.lotus22@gmail.com
ORCID: 0000-0001-7441-7253

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Sayyed Sammiyodhin Gous[1]

[1]Associate Professor, Department of Medicine, JIIU'S Indian Institute of Medical Sciences and research, Warudi, Badnapur, Jalna, Maharashtra, India

Abstract

Background: Diabetic Neuropathy is common disorder in diabetic patients and severe in chronic diabetic patients with various clinical manifestations which involve cranial and peripheral Nerves. Management of DN includes hyperglycemias and cardio-vascular risk diseases. **Materials and Methods:** 90 (Ninety) known diabetic patients aged between 30 to 75 years were studied. FBG, HbA1c, Blood pressure, lipid profile was carried out in every patient. **Result:** 33 (36.6%) had distal symmetrical peripheral Neuropathy, 17 (18.8%) had proximal Neuropathy, 13 (14.4%) had cranial and truncal Neuropathy (multiplex 25 (27.7%) had CVS manifestations, 27 (30%) had GIT, 23 (25.5%) had Genitourinary and 15 (16.6%) had miscellaneous DN related complications and elevated Bio-chemical parameters.

Conclusion: DPN severity is significantly associated with sex, age, duration of diabetes HbA1c value, HTN and BMI and management includes Hyperglycaemia and CVS risk factors.

INTRODUCTION

Diabetic Neuropathy (DN) refers to the symptoms and signs of neuropathy in a patient with diabetes in whom other causes if neuropathy has been excluded.[1] Prevalence of DN is 19.1% in India compared to western countries (1% to 2%).[2] the diagnosis of sub-clinical DN requires electro diagnostic testing and quantitative sensory and autonomic testing.[3] All diabetic patients including insulin dependent, (IDDM) non-insulin dependent diabetes mellitus (NIDDM) and secondary diabetes patients can develop Neuropathy.[4] The prevalence of neuropathy increases mellitus. About 10% of DN patient experiences persistent pain. Pain in DN can be spontaneous or stimulus induced.[5] The severity of pain also depends of longer duration of type-II DM and in un-controlled DM. Hence attempt is made to study the DN patients with various durations, clinical manifestations parameters so that present pragmatic study will help to clinician, Endocrinologist to treat such patients efficiently to avoid morbidity and mortality in such patients.

MATERIALS AND METHODS

90 (Ninety) know type-II Diabetes mellitus patients regularly visited to Medicine department JIIUS Indian Institute of Medical Sciences and research Warudi, Tq-Badnapur, Dist-Jalna, Maharashtra-431202 were studied.

Inclusive Criteria

Patients aged between 30-75 years having the clinical signs and symptoms of diabetic Neuropathy were selected for study.

Exclusion Criteria

Patients having type-I diabetes, gestational diabetes, patients below 30 years were excluded from the study.

Method: Every patients fasting, post-parandial, random blood sugar, HbA1c was studied. Concerned previous history was recorded. Their blood pressure (SBP, DBP) was recorded by spignomanometre. Total cholesterol lipid profile was carried out to study the severity of Diabetic Neuropathy.

Duration of study was October-2021 to June-2022.

Statistical analysis: Regional classification various clinical manifestations and Biochemical analysis was classified with percentage. The statistical analysis was carried out in SPSS software. The ratio of male and female was 1:2.

RESULTS

[Table 1] Regional classifications of Diabetic Neuropathy – 33 (36.6%) distal symmetrical peripheral Neuropathy, 17 (18.8%) proximal Neuropathy, 13 (14.4%) cranial and truncal Neuropathy, 27 (30%) Mano neuropathy (multiplex)

[Table 2] Clinical Manifestations of Diabetic neuropathy –

1) 25 (27.7%) cardio vascular include, 11 (12.2%) HTN, 9 (19%) tachycardia, 5 (10%) orthostatic hypotension
2) 27 (30%) Gastro Intestinal include, 6 (6.6%) Oesophageal dysfunction, 8 (8.8%) Gastro paresis, 6 (6.6%) constipation, 7 (7.7%) diarrhoea.
3) 23 (25.5%) Genitourinary included 7 (7.7%) Erectile dysfunction, 10 (11.1%) Neurogenic bladder, 6 (6.6%) cystopathy
4) 15 (16.6%) Miscellaneous include, 6 (6.6%) sweating disturbance, 5 (5.5%) heat intolerance, 4 (4.4%) hypoglycaemia

[Table 3] Biochemical analysis in Diabetic Neuropathy patients-

1) Duration of type-II DM – 10 (11.1%) 1 to 4 years, 32 (35.5%) 5 to 10 years, 48 (53.3%) more than 10 years
2) FBG (mg/dl) – 44 (48.8%) patients had 197 to 210, 46 (51.5%) had 211 to 232
3) HbA1c (mg/dl) study – 42 (46.6%) patients had 8.89 to 9.10, 48 (53.6%) had 9.11 to 10.5
4) Total cholesterol profile – 41 (45.5%) had 177-181 (mg/dl), 49 (54.4%) had 182-184 (mg/dl)
5) LDL (mg/dl) profile – 38 (42.2%) had 102 to 107, 52 (57.7%) had 108 to 111
6) Triglyceride (mg/dl) profile – 39 (43.3%) had 149-152, 51 (56.6%) had 153 to 158.
7) Systolic BP (mm/Hg) – 46 (51.1%) had 132-197, 44 (48%) had 138-141
8) Diastolic BP (mm/Hg) – 43 (47.7%) had 83.82 to 85.20, In 47 (52.2%) had 86 to 90

Table 1: Regional classification of Diabetic Neuropathy

Sl. No	Classification	No. of patients (90)	Percentage (%)
1	Distal symmetrical peripheral Neuropathy	33	36.6
2	Proximal Neuropathy	17	18.8
3	Cranial and truncal Neuropathy	13	14.8
4	Mono neuropathy (Multiplex)	27	30

Table 2: Clinical Manifestations of Diabetic Neuropathy

Sl. No	Clinical Manifestations	No. of patients (90)	Percentage (%)
1	Cardio-vascular	25	27.7
	a-Hypertension	11	12.2
	b-Tachycardia	9	10
	c-Orthostatic Hypotenuse	5	5.5
2	Gastro-Intestinal	27	30
	a-oesophageal disjunction	6	6.6
	b-Gastro paresis	8	8.8
	c-Constipation	6	6.6
	d-Diarrheal	7	7.7
3	Genito-Urinary	23	25.5
	a-Erectile dysfunction	7	7.7
	b-Neurogenic Bladder	10	11.1
	c-Cystopathy	6	6.6
4	Miscellaneous	15	16.6
	a-sweating disturbances	6	6.6
	b-Heat intolerance	5	5.5
	c-Hypoglycaemia	4	4.4

Table 3: Biochemical analysis in Diabetic Neuropathy patients

Sl. No	Details	No. of patients	Percentage (%)
1	Duration of type-II DM		
	a-1 to 4 year	10	11.1
	b- 5 to 10 year	32	35.5
	c- More than 10 years	40	53.3
2	FBG (mg/dl)		
	a- 197 to 210	44	48.8
	b- 211 to 232	46	51.1
3	HbA1c (mg/dl)		
	a- 8.89 to 9.10	42	46.6
	b- 9.11 to 10.5	48	53.6
4	Total Cholesterol (mg/dl)		
	a- 177 to 181	41	45.5
	b- 182 to 184	49	54.4
5	LDL (mg/dl)		
	a- 102 to 107	38	42.2
	b- 108 to 111	52	57.7
6	Triglyceride (mg/dl)		
	a- 149 to 152	39	43.3
	b- 153 to 158	51	56.6
7	Systolic BP ((mm/Hg)		
	a- 132 to 197	46	51.1
	b- 138 to 141	44	48

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8	Diastolic (min/Hg)		
	a- 83.82 to 85.20	43	47.7
	b- 86 to 90	47	52.2

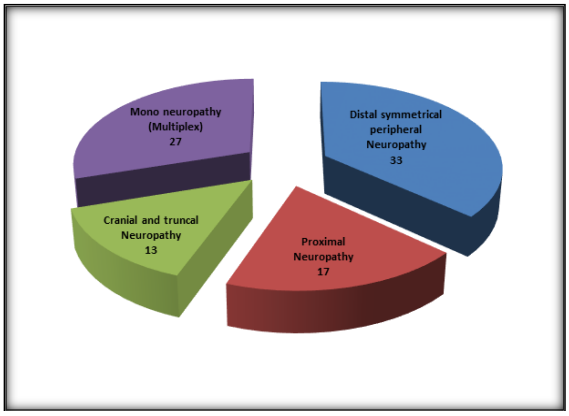

Figure 1: Regional classification of Diabetic Neuropathy

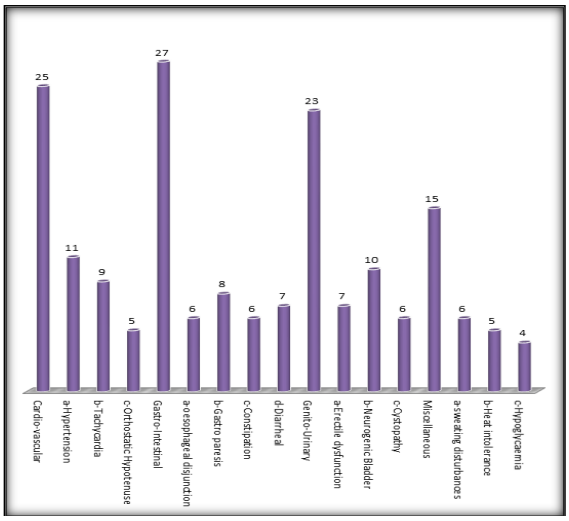

Figure 2: Clinical Manifestations of Diabetic Neuropathy

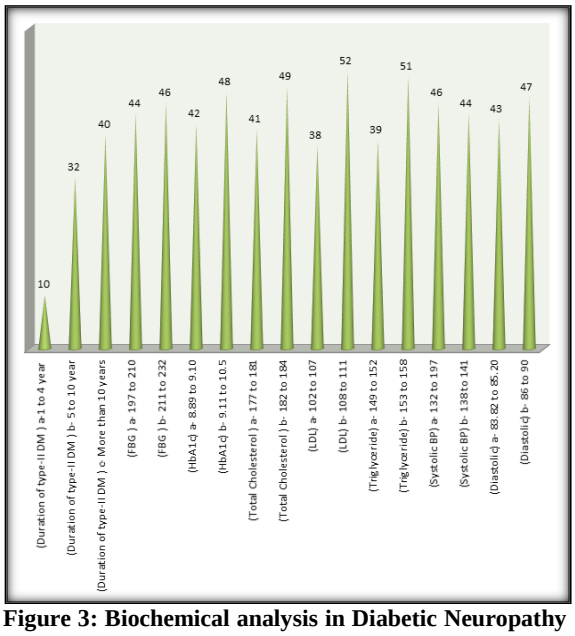

Figure 3: Biochemical analysis in Diabetic Neuropathy patients

DISCUSSION

Present study of DN in Maharashtra Population. 33 (36.3%) had distal symmetrical peripheral Neuropathy, 17 (18.8%0 had proximal Neuropathy, 13 (14.4%) had cranial and truncal Neuropathy, 27 (30%) had Mono-neuropathy (multiplex) [Table 1]. Clinical manifestation had 25 (27.7%) CVS, 27 (30%) gastrointestinal, 23 (25.5%) genitourinary, 15 (16.6%) miscellaneous complications [Table 2] Biochemical analysis reported patients had DM more than ten years 48 (53.6%) had 9.11 to 10.5 HbA1c, 49 (54.4%) had 182-184 (mg/dl), Total cholesterol, 52 (57.7%) had 108 to 11 LDL, 51 (56.6%) had 153-158 Triglyceride, 44 (48%) had 138-141 DBP [Table 3]. These findings are more or less in agreement with previous studies.[6,7,8]

It is quite significant fact that DM is closely associated with cardio-vascular genitourinary, gastrointestinal abnormalities because of nerve conduction values, sensory nerve action potentiality hence DN is an alarming factor for ischemia, infarction and or gangrene.[9]

Neuropathy can develop even before the onset of clinically diagnosable diabetes Mellitus which is known as impaired glucose tolerance neuropathy hence undiagnosed type-II DM Neuropathy patients must undergo glucose tolerance test. In patients newly diagnosed diabetes, intermittent pain and parasthesia in distal lower limb man suggest hyperglycaemic neuropathy, which improve as the hyperglycaemia is controlled.[10] In DN, sensory loss renders the patients vulnerable to foot injuries and foot destruction. Foot care therefore is integral part of DN management.

Pathology of axonal degeneration of nerve of limbs like, median, ulnar and peroneal are commonly affected in limb Neuropathies while nerve infarction involved in mono-neuropathy. Cranial neuropathy, mainly involved occulomotor nerve leads to diabetic occulomotor palsy and attributed to nerve infarction papillary fibres are peripherally located, therefore escape in diabetic occulomotor palsy. Multiple neuropathies are due to vasa nervorum.

Symptoms, signs, electro-diagnostic test quantitative, sensory and autonomic testing are the protocol to diagnose DN.

CONCLUSION

The exact cause of DN though remains unknown but ischemic and metabolic components are implicated. Hyperglycaemia induces rheological changes in which viscosity of blood impairs and there will be inadequate or complete loss of blood supply to vital organs leads to multiple diseases and DN is also included among these severe diseases. Hence special

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attention must be paid to patient with hyperglycaemia, apart from medication nutrition, life style, must be balanced. This study demands further, hormonal, genetic, nutritional, pharmacological studies because exact pathogenesis of DN is still unclear.

Limitation of Study

Due to tertiary location of research centre, small number of patient's, lack of latest techniques we have limited findings and results.

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