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"A STUDY ON ETIOLOGICAL AND CLINICAL PROFILE OF PERIPHERAL NEUROPATHY".

Neurology

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ABSTRACT

INTRODUCTION: Peripheral neuropathy (PN) is heterogenous in aetiology ,diverse in pathology and varied in severity. This topic is least explored and available information is insufficient to draw conclusions to progress further in diagnosis of disease/management of patients.

AIMS AND OBJECTIVES: To study etiologies and clinical profile of peripheral neuropathy.

MATERIAL AND METHODS: This is prospective observational study on 100 consecutive patients with symptoms and signs of peripheral neuropathy. Detailed history, detailed neurological examination and electrodiagnostic tests, routine and specific laboratory tests were recorded in all patients.

CONCLUSION: Most common risk factor associated with peripheral neuropathy is diabetes mellitus followed by nutritional deficiency secondary to alcohol consumption. Sensory symptoms like paraesthesia and neuropathic pain are common at the time of presentation followed by sensorimotor symptoms. Small fiber neuropathy is common sensory deficit followed by both small and large fiber neuropathy.Most common etiology of peripheral neuropathy is Diabetic neuropathy followed by Guillain-Barrè syndrome and nutritional neuropathy.Most common pattern observed in Nerve Conduction Studies(NCS) is sensorimotor demyelinating type.

KEYWORDS

Peripheral neuropathy, Diabetic neuropathy, electrodiagnostic study.

INTRODUCTION:

Peripheral neuropathy (PN) refers to clinical disorder in which peripheral portion of nervous system is diseased which includes several cell types(anterior horn cells, dorsal root ganglion cells, autonomic ganglion cells, satellite cells, Schwann cells, and connective tissue) and structures (spinal nerves, nerves of the extremities, cranial nerves, and the cervical, brachial and lumbosacral plexi). It is heterogenous in aetiology ,diverse in pathology and varied in severity. PN is very common with an estimated prevalence of 2% to 3% of the general population, 8% in patients older than 55years and 24% in patients older than 65.[1,2] PN causes sensory deficit, motor deficit and autonomic dysfunction leading to sustainment of injuries/ wounds and limitation of activity and thus decreasing quality of life. The current topic "A study on etiological and clinical profile of Peripheral Neuropathy" is chosen as there are very few studies available on it in India. This topic is least explored and available information is insufficient to draw conclusions to progress further in diagnosis of disease/ management of patients.

AIMS & OBJECTIVES OF THE STUDY:

To study etiologies and clinical profile of peripheral neuropathy in 100 consecutive patients attending to Gandhi general hospital, secunderabad with symptoms and signs of peripheral neuropathy during period of January 2015 to October 2016.

PATIENTS AND METHODS:

STUDY DESIGN: Prospective observational study

SELECTION CRITERIA:

A) INCLUSION CRITERIA:

- All patients presenting with symptoms and signs of peripheral neuropathy.
- All suspected cases of peripheral neuropathy.

B) EXCLUSION CRITERIA:

- Patients with features of myeloneuropathy and myelopathy are excluded from the study.

SAMPLE SIZE: 100 consecutive patients with signs and symptoms of peripheral neuropathy attending to Gandhi General Hospital, Secunderabad with symptoms and signs of peripheral neuropathy during period of January 2015 to October 2016.

STUDY PROTOCOL:

All the patients included in the study were subjected to detailed history, detailed neurological examination, routine and specific laboratory tests, electrodiagnostic tests were recorded in all patients. Detailed neurological examination includes study of higher mental functions, cranial nerve examination, and examination of motor and sensory systems, and gait. Baseline investigations included complete hemogram, erythrocyte sedimentation rate (ESR), blood sugar estimation, and study of serum electrolytes, kidney and liver function tests and all other routine biochemical investigations. Chest radiography and electro-cardiography were performed in all the study subjects. Selected subjects were subjected to special investigations like toxin screening of lead and arsenic, retroviral serology using ELISA method, glycated haemoglobin levels (HbA1C), thyroid function test, Vitamin B1 and B12 levels,serum folate levels, serum and urine electrophoresis, rheumatoid factor, antinuclear antibodies (ANA) and antinuclear cytoplasmic antibodies (cANCA and pANCA), slit skin smear, cerebrospinal fluid analysis were conducted in selected subjects. Electro diagnostic study was conducted in all the subjects to observe the pattern and type of various peripheral neuropathies. A demyelinating neuropathy was assumed if the Conduction velocity was <28m/sec and compound muscle action potential (cMAP)>10m,axonal neuropathy was assumed if cMAP was <10m with nerve conduction velocity of >28m/s.Nerve biopsy was considered in patients with no etiological diagnosis. These biopsies are done on sural nerves and subjected to histopathological examination. Clearance was obtained from the ethical clearance committee of the institution.

DATA ANALYSIS: The data was compiled and studied by experienced statistician.

Student't' test and chi-square test were performed wherever necessary. Data will be presented in the form of tables.

RESULTS:

All the 100 patients studied and summarised as follows:

- Age ranged from 15 to 79 years with mean age 44.1years+/- 16.3years with maximum (37%) in age group 31-45 years.
- Majority (66%) of patients are males and male to female ratio is 1.9:1.
- Duration of illness ranges from 2days to 1year.In majority (53%) of patients, the duration of illness is 1-3 months.Mean duration of illness is 67.05 days+/- 59.5 days.
- Mode of onset is gradual in 84% of patients.
- Both alcohol consumption and smoking are addictions in 27% of patients.
- Most common risk factor is diabetes mellitus in 41% of patients followed by nutritional deficiency in 35% of patients.
- Pure sensory symptoms are seen in 61% of patients followed by sensorimotor in 23%,sensory and autonomic symptoms in 13% and puremotor in 3% of patients.

TABLE NO.1
SYMPTOMS OVERVIEW

SYMPTOM	NO. OF PATIENTS	PERCENTAGE (%)
Pure sensory	61	61
Pure motor	3	3
Autonomic	0	0
Sensorimotor	23	23
Sensory + autonomic	13	13
Total	100	100

- Of sensory symptoms, positive symptoms like paraesthesia and neuropathic pain are seen in 55% of patients.
- Of motor symptoms(26%),weakness is present in 22% of patients.
- Autonomic symptoms like giddiness/fainting spells are seen in 13% of patients.

TABLE NO.2
SYMPTOM PROFILE

SYMPTOM	NO. OF PATIENTS	PERCENTAGE (%)
SENSORY	97	97
Paraesthesia & Neuropathic pain	55	55
Paraesthesia only	13	13
Neuropathic pain only	12	12
Numbness	17	17
MOTOR	26	26
Weakness	22	22
Atrophy	04	06
AUTONOMIC	13	13
Giddiness/fainting spells	13	13

- On neurological examination, sensory deficit like small fiber neuropathy is seen in 49% of patients, both small and large fiber neuropathy is seen in 42% of patients.
- Among motor deficits, polyneuropathy is seen in 16% followed by mononeuropathy in 12% of patients.
- Autonomic dysfunction is seen in 13% of patients.
- Cranial nerve palsy (VII) is seen in 16% of cases (11% have bilateral and 5% have unilateral involvement).
- Peripheral nerve thickening is seen in 4% of cases.

TABLE NO.3
CLINICAL FINDING PROFILE

Clinical Finding	No. of Patients	Percentage (%)
SENSORY DEFICIT		
Small fiber neuropathy	49	49
Large fiber neuropathy	6	6
Both	42	42
Absent	3	3
MOTOR DEFICIT		
Mononeuropathy	12	12
Mononeuritis multiplex	2	2
Polyneuropathy	16	16
Absent	70	70
AUTONOMIC DYSFUNCTION		
Yes	13	13
No	87	87
CRANIAL NERVE (VII) involvement		
Bilateral	11	11
Unilateral	5	5
Absent	84	84
PERIPHERAL NERVE THICKENING		
Yes	4	4
No	96	96

- Sensorimotor demyelinating type is most common pattern observed in Nerve conduction studies (NCS) in 51% followed by sensorimotor axonal type in 36%.

TABLE NO.4 PATTERN OF NEUROPATHY ACCORDING TO NCS

PATTERN OF NEUROPATHY	NO. OF PATIENTS	PERCENTAGE(%)
Pure motor axonal	8	8
Pure motor demyelinating	5	5
Sensorimotor demyelinating	51	51
Sensorimotor axonal	36	36

- Diabetic neuropathy is commonest type of neuropathy (43%) followed by Guillian-Barrè syndrome (16%) and nutritional neuropathy (14%).

TABLE NO.5 ETIOLOGICAL CLASSIFICATION OF NEUROPATHY

ETIOLOGY	NO. OF PATIENTS	PERCENTAGE(%)
Diabetes mellitus	43	43
Guillain-Barrè syndrome	16	16
Entrapment neuropathy	12	12
Infectious neuropathy		
Leprosy	4	4
HIV	2	2
Nutritional neuropathy		
Vit B1 deficiency	8	8
Vit B12 deficiency	6	6
Uremic neuropathy	6	6
Neuropathy asso. with rheumatologic disorder	3	3
Total	100	100

DISCUSSION:

Peripheral neuropathy is a common neurological problem with variable presentations caused by various infective[3,4,5] non-infective causes[6,7,8] and variety of other etiologies.[9,10,11,12] In our study , age of patients ranged from 15 to 79 years, mean age being 44.1years with male (66%) preponderance. Duration of illness is 1-3months in 53% of patients. Mode of onset is gradual in 84% and diabetes mellitus is most commonly associated risk factor in 43% patient. All these findings were similar to study of Afroza Jan et al.[13] Most common presentation is both paraesthesia and neuropathic pain in 55% where as in Afroza Jan et al[13] study paraesthesias are seen in 82% and 52% according to Abhijeet A.Adgaonakar[14] study.On symptoms overview,Pure sensory is seen in 61% patients followed by sensorimotor in 23% and this finding is similar to the studies of Afroza Jan et al[13] and Sase et al.[15] In clinical finding profile, sensory deficit i.e small fiber neuropathy is seen in 49%,motor deficit i.e polyneuropathy in 16% and autonomic dysfunction in 13% whereas higher values were seen with Roser et al[16] study.

Bilateral facial nerve palsy is seen in 11% and Peripheral nerve thickening is seen in 4%.In the present study sensorimotor demyelinating pattern is seen in 51% followed by sensorimotor axonal in 36% according to nerve conduction studies. Although higher values (71%) of sensorimotor demyelinating pattern is seen Afroza Jan et al[13] and Sase et al[15] studies, it being the most common pattern supports this study. The most common etiology is Diabetes mellitus with 43% followed by Guillain Barrè syndrome(GBS) in 16% and Nutritional deficiency in 14%,this is comparable to study of Afroza Jan et al[13] where Diabetes mellitus is seen in 55% and GBS in 13%. Though the etiology is diverse, in majority of cases diagnosis can be confirmed using non-invasive diagnostic tools.

LIMITATIONS OF THE STUDY

The major limitation of the study is that it was done in a small group and may not represent the entire population.

RECOMMENDATIONS FOR FURTHER STUDY

More studies using large population samples are needed to clarify the profile of neuropathies in variety of medical disorders.

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