CLINICAL PROFILE OF PERIPHERAL NEUROPATHY IN GERIATRIC POPULATION

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ABSTRACT

Objectives: The objective of this study was to describe the clinical profile of peripheral neuropathy (PN) in the geriatric population.

Methods: This prospective observational study was done among patients >65 years, found to have PN by Neuropathy Symptom Score, who were undergone history and clinical examination at the Department of Medicine and Gandhi Medical College and associated Hamidia Hospital Bhopal. Nerve conduction study was done in all subjects to observe the pattern and type of various peripheral neuropathies. Special investigations such as Serum Vitamin B-12, toxin screening of lead and arsenic, viral serology using the ELISA method, serum and urine electrophoresis, rheumatoid factor, antinuclear antibodies (ANA), and antinuclear cytoplasmic antibodies (c-ANCA and p-ANCA), and CSF examination were done as and when needed.

Results: Most of the patients were in the 60–65 years [93 (46.5%)] of age followed by 66–70 years [54 (27%)]. Most common clinical feature was Tingling [120 (60%)] followed by Tingling and Numbness [36 (18%)]. In most of the subjects, deep tendon reflexes were normal [132 (66%)] whereas in 42 (21%) subjects deep tendon reflexes were impaired and in 26 (13%) subjects deep tendon reflexes were absent. Most of the patients had sensory motor axonal demyelinating neuropathy [8 (4%)].

Conclusion: PN is a heterogeneous disease with diverse pathology. Recognition of the clinical homolog of these pathological processes is the first step in achieving the appropriate form of intervention. Treatment should be individualized such that the particular manifestation and underlying pathogenesis of each patient's unique clinical presentation are considered.

Keywords: Clinical profile, Peripheral neuropathy, Geriatric population.

INTRODUCTION

Peripheral neuropathy (PN) is one of the challenging diagnoses encountered by a neurologist with an estimated prevalence of 2–8% in the general population [1]. The incidence of PN increases with age, commensurate with "aging" of the peripheral nervous system and the high prevalence of systemic disorders like diabetes mellitus [2]. Increased morbidity and impaired quality of life in elderly with PN are recognized [3]. The etiology of neuropathy in the elderly is varied, and the leading causes include vasculitis, diabetes, alcohol, and nutritional deficiencies. The diagnostic work-up needs to be tailored to each individual patient based on the bedside history and examination, topographic pattern, and evolution of clinical symptoms and signs [4]. Diabetes mellitus is the most common cause of PN. Since the prevalence of diabetes mellitus increases with age, the prevalence of diabetic PN is also expected to rise. Other common causes of PN in the elderly include a range of metabolic disorders, infectious agents, vasculitis toxins, drugs, and inherited polyneuropathies. To study the pattern and etiology of various types of peripheral neuropathies, it forms the basis of the present study [5]. Recognition of these deficits is particularly important because PN may contribute to the vulnerability to falls that is common in this age group [1]. PN commonly causes impairment of proprioception and balance, which can be identified from an inability to maintain unipedal stance for 10 s, impaired position sense at the great toe, and a decreased vibratory sense that improves proximally [6]. Recognition of the cohort of patients with these deficits may identify treatable causes and provide a better management plan for patients prone to falling [6]. Neurophysiological studies are helpful in distinguishing axonal from demyelinating neuropathies. However, in the presence of small fiber neuropathy, these tests often are not useful. Usually, there are no specific treatments available. A multidisciplinary approach with pain relief, physiotherapy, and management of anxiety and depression is important in managing these patients. Through a combination of clinical findings, electrodiagnostic test, and other relevant laboratory investigations tailored to the individual patients, most neuropathies can be categorized by subtypes and on the basis of etiology. Such classifications allow rational assessment of prognosis and treatment options. Treatment modalities are divided into those, that are specific for the subtype of neuropathy and those that are useful for neuropathies in general. Investigations may include various blood tests, X-rays, scans, or other tests. Common tests are including nerve conduction testing and electromyography. The nerve conduction test looks at the speed that electrical signals pass through the nerves [7]. Nerve conduction studies (NCS) are the most sensitive and reproducible measure of peripheral nerve functions. They are done to diagnose the disorders of the peripheral nervous system Neuropathy Symptom Score is a screening system developed to screen for neuropathy in patients [5]. Hence, the present study was performed to describe the clinical profile of PN in the geriatric population.

Objectives

The objective of this study was to describe the clinical profile of PN in the geriatric population.

METHODS

This prospective observational study was conducted among 200 cases admitted in the Department of Medicine, Gandhi Medical College and associated Hamidia Hospital Bhopal for the duration of 1 year (April 2017–March 2018). After approval from the Institutional Ethics Committee, we have planned to study 200 cases of PN.

Methodology

Patients > 65 years found to have PN by Neuropathy Symptom Score were undergone history and clinical examination.

NCS was done in all subjects to observe the pattern and type of various peripheral neuropathies. Special investigation such as Serum Vitamin B-12, toxin screening of lead and arsenic, viral serology using ELISA method, serum and urine electrophoresis, rheumatoid factor, antinuclear antibodies (ANA), and antinuclear cytoplasmic antibodies (c-ANCA and p-ANCA), CSF examination were done as and when needed. NCS are the most sensitive and reprucidable measure of peripheral nerve functions. They are done to diagnose the disorders of the peripheral nervous system Neuropathy Symptom Score is a screening system developed to screen for neuropathy in patients.

Neuropathy Symptom Score consists of five questions. Each question will be assessed with points to calculate the total symptom score. The total symptom score will be calculated and converted into the grade of symptom. 3–4 points were converted into mild symptoms, 5–6 points into moderate symptoms, and 7–9 points into severe symptoms.

1. Burning, numbness, and tingling (2) or Fatigue, cramping, and aching (1) feelings in the lower extremity
2. The feelings (symptoms) are present in the feet (2) or calf (1)
3. There are nocturnal exacerbation of the feelings (symptoms)(2) or they are equally present during the day and night (1)
4. The feelings (symptoms) wake the patient up from sleep (1)
5. Walking (2) or standing (1) maneuvers reduce symptoms

Inclusion criteria

The following criteria were included in the study:

• Age more than 65 years.
• Cases showing Neuropathy Symptom Score more than 3.

Exclusion criteria

The following criteria were excluded from the study:

• Age <65 years
• History of Nerve Injuries.
• Acute or chronic musculoskeletal disorder
• Cases unable to stand unassisted more than 1 min
• Non ambulatory patient

Data collection and methods and statistical analysis

Demographic details of all the study subjects were collected on an individual basis by filling of the Proforma (encl attached) following written consent (attached encl). All subjects were enrolled for the study were undergone the laboratory tests as listed above. NCS were done in all cases. All the data analysis was done using IBM SPSS version 20 software. Frequency distribution and cross-tabulation were used to prepare tables. Microsoft Word 2010 was used to prepare graphs. The parametric students "t" test was used to compare mean+SD. According to the characteristics of the subjects were compared using the Chi-square test value of <0.05 will be considered statistically significant.

OBSERVATION AND RESULTS

Most of the patients were in the 60–65 years 93 (46.5%) of age followed by 66–70 years 54 (27%). Maximum patients were male 137 (68.5%), followed by female 63 (31.5%).

Maximum patients had diabetes mellitus [79 (29%)] followed by hypothyroidism [25 (9.2%)] as the most common history.

Most common clinical feature in the present study was tingling [120 (60%)], followed by tingling and numbness [36 (18%)].

Above table shows that mean NSS, NDS, refill time, pedal pulse, and IMF was 5.68±0.74, 4.89±0.74, 0.92±0.27, 1.53±0.53 and 4.07±1.10, respectively.

Graph 1 shows that most of the subject's deep tendon reflex were normal [132 (66%)] whereas in 42 (21%) subjects deep tendon reflexes were impaired and in 26 (13%) subjects deep tendon reflexes were absent.

Graph 2 shows that the most common diagnosis in the study cohort was diabetic neuropathy [77 (38.5%)] followed Hypothyroidism [25 (12.5%)] and diabetic neuropathy/HTN [13 (6.5%)].

DISCUSSION

In the present study, most of the patients were in the 60-65 years [93 (46.5%)] of age followed by 66–70 years [54 (27%)]. Maximum patients were male [137 (68.5%)] followed by female [63 (31.5%)] In a similar study by Ozkaraman *et al.* [8] reported that the average age of participants was 68.46±5.8 and most of them were males (63.3%). Adgaonkar *et al.* [7] comprised a study of profile PN in 50 patients of diabetes mellitus clinically as well as by NCS and reported that maximum patients were male (n=30). In the present study, the maximum patients had diabetes mellitus [79 (29%)] followed by
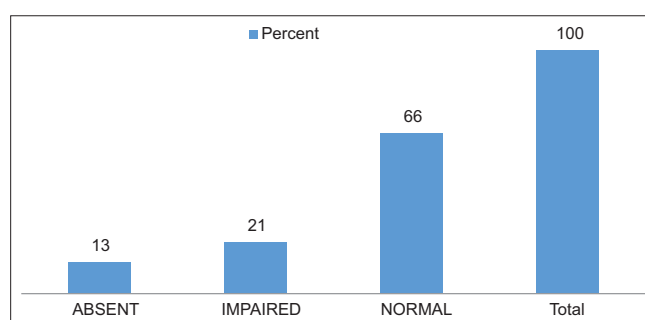
Graph 1: Deep tendon reflex

Table 1: Age distribution

Age groups	No of patients	Percent
60–65	93	46.5
66–70	54	27.0
71–75	27	13.5
76–80	15	7.5
>80	11	5.5
Total	200	100.0

Table 2: History

History	No. of patients	Percent
Nil	120	44.1
Alcoholic	11	4.0
CKD	9	3.3
DM	79	29.0
HTN	19	7.0
Hypothyroidism	25	9.2
Leprosy	1	0.4
PLHA	1	0.4
RA	7	2.6
Total	272	100.0

Table 3: Clinical feature

Clinical feature	No. of patients	Percent
Burning feet	3	1.5
Limb weakness	11	5.5
Tingling	120	60.0
Tingling and Burning	25	12.5
Tingling and numbness	36	18.0
Tingling numbness and burning	5	2.5
Total	200	100.0
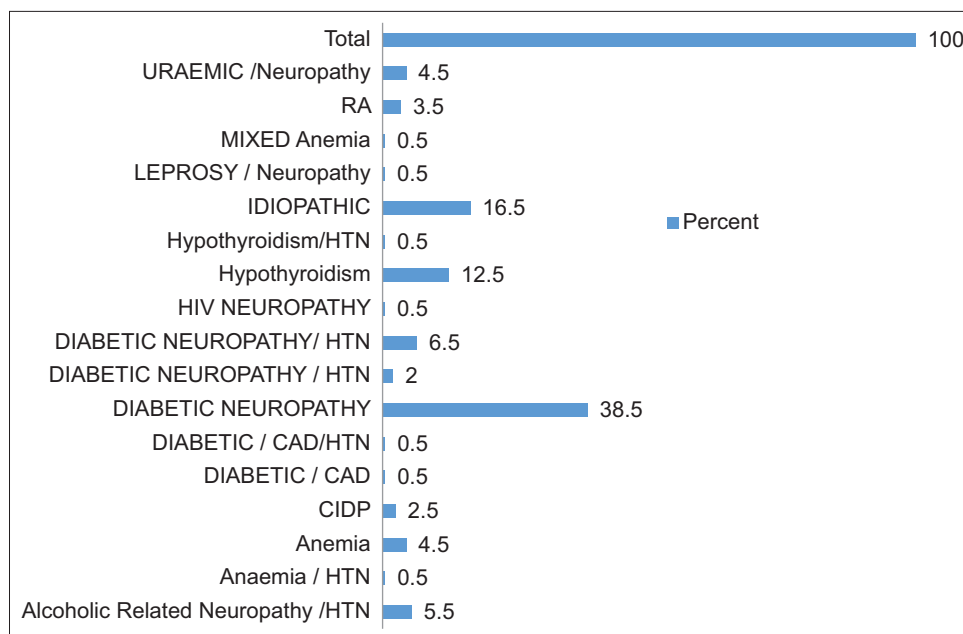
Graph 2: Diagnosis

Table 4: Nerve conduction studies

Nerve conduction studies	N	Minimum	Maximum	Mean	Std. Deviation
NSS	200	4	7	5.68	0.747
NDS	200	4	7	4.89	0.742
Refill time	200	0	1	0.92	0.272
Pedal pulse	200	0	2	1.53	0.539
IMF (Balance and coordination	200	1	6	4.07	1.108

hypothyroidism [25 (9.2%)] as the most common history. In a similar study by Mold *et al.* [9] found that 219 out of 795 subjects (27.5%) gave a history of at least one disease known to cause PN which strengthen the present study findings where most of the patients had a history of diabetes which an important risk factor for the development of the PN. In present study most common clinical feature in present study was tingling [120 (60%)] followed by tingling and numbness [36 (18%)]. Adgaonkar *et al.* [7] reported that common mode of PN was tingling and numbness which was found in 15 cases (30%) followed by impaired vibration 13(26%), impaired ankle jerk (24%), impaired touching (18%) and pain in 8 (16%). Mold *et al.* [9] reported that out of 795 patients the proportions of patients with one or more deficits who reported symptoms were as follows: numbness of extremities, 28%; pain or discomfort, 48%; restless legs, 31%; trouble walking, 44%; and trouble with balance, 35%. The relationship between PN and hypertension is particularly interesting. This is in sharp contrast to the findings of Zarelli *et al.* [10] who found that Italian primary care patients with hypertension were 4.5 times more likely to have chronic symmetrical neuropathy after controlling for diabetes and other relevant factors. Aside from the difference in demographics, their study included only those with symptoms related to their neuropathy, and they included patients >55 years old. This is an important issue for further investigation because hypertension is a risk factor for vascular disease, which could be a cause of "idiopathic" neuropathy, a possibility supported by a case-control study conducted in the Netherlands [11]. Contrary to that mean SBP and DBP in the present study were not significantly higher (130.66±16.86 and 84.98±10.05 respectively). Diabetes is the most common cause for PN in the community (Verghese, 2001, George, 1986) and was a common comorbidity in the current study. In the present study, the mean FBS and PPBS were 138.36±29.31 and 231.75±38.80 mg/dl, respectively. In the present study, it was observed that the severity of PN was related with blood sugar. The higher the blood sugar level, severe is the neuropathy. Contrary to the present study Adgaonkar *et al.* [7] reported that the maximum incidence of PN was noted in blood sugar >300 mg%. Below 200 mg% no patient was symptomatic. In the present study, in most of the subjects deep tendon reflexes were normal [132 (66%)] whereas in 42 (21%) subjects deep tendon reflexes were impaired and in 26 (13%) subjects deep tendon reflexes were absent. Impallomeni *et al.* [12] carefully assessed the ankle reflexes of 200 consecutive older patients admitted to the geriatric inpatient service of a hospital in England (mean age, 80; range, 65–99). They reported that only nine patients (4.5%) had bilaterally absent reflexes. Other researchers have found much higher percentages of older people to have this abnormality. In the present study, most of the patients had sensory motor axonal demyelinating neuropathy [8 (4%)]. Anish *et al.* [1] studied 100 elderly subjects aged 65 and above with PN who underwent nerve biopsy and reported that the most common pattern of was distal symmetric sensorimotor polyneuropathy (35%), followed by multiple mononeuropathy (29%) and asymmetric sensorimotor neuropathy (15%). Most common diagnosis in study cohort was diabetic neuropathy [77 (38.5%)] followed Hypothyroidism [25 (12.5%)] and diabetic neuropathy/HTN [13 (6.5%)]. Anish *et al.* [1] studied 100 elderly subjects aged 65 and above with PN who underwent nerve biopsy and reported that the most common pattern of was distal symmetric sensorimotor polyneuropathy (35%), followed by multiple mononeuropathy (29%) and asymmetric sensorimotor neuropathy (15%).

CONCLUSION

PN is a heterogeneous disease with diverse pathology. Recognition of the clinical homolog of these pathological processes is the first step in achieving the appropriate form of intervention. Treatment should be individualized such that the particular manifestation and underlying pathogenesis of each patient's unique clinical presentation are considered.

In older adults, special care should be taken to manage pain while optimizing daily function and mobility, with the fewest adverse side effects from medication. Older adults are at great risk for falling and fractures due to instability, and weakness and require strength exercises, co-ordination training. Ultimately agents that address large fiber dysfunction will be essential if we are to reduce the gross impairment of QOL and ADLs that neuropathy visits on the older person, especially with diabetes.

CONFLICTS OF INTEREST

None declared.

FUNDING

Nil.

AUTHORS CONTRIBUTION

GKS – Making the research paper from his own dissertation, literature review, prepared the first draft of the manuscript, implementation of the study protocol, data collection, data analysis; AJ – Concept, clinical protocol, manuscript preparation, editing, and manuscript revision, manuscript preparation; PSS – Literature survey and preparation of figures; and DD – Design of study, statistical analysis, and interpretation and submission of the article.

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