ORIGINAL ARTICLE

Profile of Peripheral Neuropathy in A Tertiary Care Hospital in Punjab, India

Vishali Kotwal, Amit Thakur*

Abstract

To study the clinical profile of peripheral neuropathy in a tertiary care setting. 80 patients in the age range of 16-85 years were enrolled in the study. Demographic profile, detailed examination and relevant investigations including electrodiagnostic study was conducted on all the patients. Diabetes mellitus was found to be the commonest cause followed by entrapment neuropathy, idiopathic neuropathy, alcohol related neuropathy and GBS. Mixed sensorimotor involvement was the most common .Lower limbs were involved in most of the cases with peroneal nerve being the most common nerve involved. Peripheral neuropathy is a commonly seen disease with diabetes mellitus, entrapment neuropathies and alcohol related neuropathies being most common in this region. Larger studies are needed in future to clarify the scenario further.

Key Words

Peripheral Neuropathy, Diabetic Neuropathy, Diabetes Mellitus

Introduction

Peripheral neuropathy is a common clinical entity. It has a large number of causes (1,2) including metabolic,(3,4,5) infective, inflammatory (6), immune-mediated (7,8,9,10), compressive (11), toxic (12), nutritional (13) and other causes (14,15,16,17).It can present in different forms either symmetrically or asymmetrically with predominant motor or sensory symptoms. So, it can be classified either on the basis of etiology or it's clinical and electrophysiological presentation.(18) These classifications help in assessing the prognosis as well treatment options for this disorder which are specific for different sub-types.

The overall prevalence of peripheral neuropathies is around 2400 per 100000 population but in patients older than 55 years, the prevalence rises to about 8000/1 lac.(19,20).Diabetes mellitus has been found to be the commonest cause in adults in India as well as in the developed world followed by other causes.(20,21,22,23,24) .However, no such published study is yet available from Punjab State of India .To study the electrophysiological pattern and etiology of various types of peripheral neuropathies form the basis of the present study. To our knowledge, this is the first study of its kind from the state.

Material and Methods

This was astudy conducted in the Postgraduate Department of Medicine , Guru Govind Singh Medical College, Faridkot Punjab ,a tertiary care center of Punjab

From the Dept. of Medicine & Orthopedics*, GGS Medical college and Hospital, BFUHS Faridkot ,Punjab.- India
Correspondence to : Dr Vishali Kotwal, Asst. Prof. Dept. of Medicine, GGS Medical college and Hospital, BFUHS Faridkot ,Punjab.

State. This included 80 patients studied from March 2011 to December 2011.The patients recruited for the study were subjected to a detailed history, clinical examination and routine and special investigations needed . The age of the patients ranged from 18 to 82 years and the majority of patients were 40 to 60 years. There were 41 male patients and 39 female patients .All the patients were subjected to a detailed neurological examination which included study of higher mental functions, cranial nerve examination and motor and sensory system examination and gait. Baseline investigations included a complete hemogram, ESR, blood sugar levels, serum electrolytes, thyroid function tests, liver function tests, renal function tests. Selected subjects were subjected to special investigations like serum vitamin B12 levels, toxic screening for lead and arsenic, retroviral serology using Elisa method, serum and urine electrophoresis, rheumatoid factor and ANA. Electrodiagnostic study was conducted in all subjects to observe the pattern and type of various peripheral neuropathies. For motor nerve conduction study, surface electrodes were used. For Sensory nerve conduction study, Antidromic method was used i.e proximal stimulation with distal recording which is opposite to the physiological direction of impulse flow and surface ring electrodes were used. Evaluated variables included distal motor latency, motor and sensory conduction velocities, Compound muscle action potential and Sensory nerve action potential. The variables were considered abnormal when they exceeded mean +_ 2 SD. A demyelinating neuropathy was assumed if the distal latency exceeded 115% of upper limit of normal with a normal CMAP or more than 150% of normal with a reduced CMAP . An axonal neuropathy was assumed if Amplitude was decreased with a normal distal latency and conduction velocity. Patients with features of myelopathy and myeloradiculopathy were excluded from the study.

Results

Among the studied subjects, the clinical presentation was variable(*Table 1*).Paraesthesias in both the lower limbs was the most common symptom observed in 25% of patients, paraesthesias in all the 4 limbs was seen in17.5%, weakness of both the lower limbs was observed in 15% followed by weakness of all the 4 limbs seen in12.5% of the patients .Majority of patients had bilateral distribution observed in 82.5% of subjects. Onset was insidious in 70% and the course of the disease was progressive in 93.7% of the subjects. Diabetes mellitus was the most common cause seen in 25% of cases followed by entrapment neuropathy and idiopathic cases seen in 17.4% each, alcohol related neuropathy seen in 12.5%, Guillian Barre Syndrome present in 8.7% and CIDP in 6.2% of subjects.(*Table 2*). Cranial nerve palsy (bilateral 3rd and 6th nerve palsy) was seen in 1 patient of carcinomatous neuropathy secondary to Carcinoma lung. Sensory abnormalities were found in 83% subjects, motor system abnormalities were seen in 71% and hyporeflexia in 88% of the patients. Mixed sensorimotor neuropathy was the commonest presentation seen in 88.7% of cases, pure sensory abnormality was seen in 5% and pure motor involvement was seen in 6.2% cases. Rheumatoid arthritis related neuropathy was seen in 2 (2.5%) subjects .Nerve conduction study revealed sensorimotor demyelinating neuropathy as the commonest type (*Table 3*)and Common peroneal nerve was the commonest nerve involved.(*Table4*)

Discussion

Peripheral neuropathy is a very common clinical entity with a varied presentation and and diverse etiology (1,2) including infectious, metabolic (3,4,5), inflammatory (6), autoimmune (7,8,9,10), compressive (11), toxic (12),nutritional (13) and other causes (14,15,16,17) .In our study , paresthesias and pain were the most common symptom similar to the study by Beghi and co-workers.(19) and male to female ratio was 1.2:1 while in study by Sase and coworkers 62% of the patients were male(21) and in the study of Goel and co-workers, majority of patients were male (22).Onset was insidious in 70% of cases and bilateral involvement was seen in

Table 1. Clinical features at Presentation

Pattern of involvement		No. of patients	Percentage
	Paraesthesia and pain both lower limbs	20	25%
	Weakness both lower limbs	12	15%
	Paraesthesia and numbness all four limbs	14	17.5%
	Weakness all four limbs	10	12.5%
	Pain and numbness both upper limbs	06	7.5%
	Pain and weakness right upper limb	05	6.25%
	Pain and weakness left upper limb	03	3.75%
	Pain and weakness both upper limbs	04	5%
	Pain and weakness right lower limb	06	7.5%
Distribution	Unilateral	14	17.5%
	Bilateral	66	82.5%
Onset	Acute	05	6.25%
	Sub acute	19	23.75%
	Insidious	56	70%
Course	Progressive	75	93.7%
	Static	05	6.25%

Table2.. Etiological Classification of Neuropathy

Causes	No. of Patients	Percentage
Diabetic	20	25
GBS	07	8.75
CIDP	05	6.25%
Idiopathic	14	17.4%
Entrapment neuropathy	14	17.4%
Hypothyroidism	04	5%
Carcinomatous	01	1.2%
Rheumatoid arthritis	02	2.5%
Alcohol related	10	12.5%
Multifocal Motor Neuropathy with conduction block	02	2.5%
Mono neuritis multiplex	01	1.2%

82% which is similar to the study of Sase and co-workers (21). Diabetes was the commonest cause in our study which is similar to the previous published studies (22,23,24) while Verghese etal found diabetes as the most common cause in young old patients and idiopathic neuropathy as the most common cause in old old patients in their study (25) . Lee HS etal found inflammatory neuropathy as the most common cause in children in their study followed by hereditary.(26) The second common cause in our study was entrapment neuropathy and idiopathic which is not in previous published studies where GBS was found to be the second commonest cause by Sase and co-workers (21) and Alcoholic and toxic neuropathy followed diabetic neuropathy in study by Mygland and co-workers.(23)This was followed by alcohol related neuropathy seen in 12.5% of patients . CIDP was seen in 6.2% which is similar to Lubec and co-workers.(24) Sase and co-workers(21) reported entrapment neuropathy in 9% which is less than our study .Median nerve entrapment is the commonest entrapment in our study similar to previous studies. Hypothyroidism as a cause of neuropathy was found in 5% cases in our study while Sase and co-workers reported it in 1% of the cases.

Study done on idiopathic polyneuropathy by Vrancken and his co-workers showed that it was neither affected by the aging of the peripheral nervous system nor the disease duration but patients with early onset and short duration disease were more disabled than patients with

Table 3. Pattern of Neuropathy According to Nerve Conduction Study in Various Groups of Neuropathy

Type of neuropathy	Axonal sensory		Pure motor Axonal		Pure motor demyelinating		Mixed sensory motor axonal & demyelinating		Sensory motor axonal		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Diabetic	0		0		0		15	75%	5	25%	20	25%
GBS	0		1	14.2%	1	14.2%	1	14.2%	4	57%	7	8.75%
CIDP	0		0		1	20%	4	80 %	0		5	6.25%
Idiopathic	0		0		0		4	28.5%	10	71.4%	14	17.4%
Entrapment neuropathy	0		0		0		14	100%	0		14	17.4%
Hypothyroidism	0		0		0		3	75%	1	25%	4	5%
Carcinomatous	0		0		0		0		1	100%	1	1.2%
Rheumatoid arthritis	0		0		0		2	100%	0		2	2.5%
Alcohol related	4	40%	0		0		0		6	60%	10	12.5%
Multifocal Motor Neuropathy with conduction block	0		2	100%	0		0		0		2	2.5%
Mono neuritis multiplex	0		0		0		0		1	100%	1	1.2%

Table 4. Percentage of Nerves Involved According to Nerve Conduction Study in Various Neuropathies

Type of neuropathy	Median	Ulnar	Radial	Common peroneal	Tibial
Diabetic	10	10	04	20	15
GBS	04	04	02	07	07
CIDP	02	02	01	05	05
Idiopathic	08	08	06	14	12
Entrapment neuropathy	10	02	03	02	02
Hypothyroidism	0	0	0	04	04
Carcinomatous	01	01	01	01	01
Rheumatoid arthritis	0	0	0	02	02
Alcohol related	04	04	02	06	06
Mono neuritis multiplex	01	0	0	01	0

late onset.(27) Stefano Jann and co-workers found no possible etiological factor during a four year follow-up of their patients with chronic idiopathic neuropathy and found that clinical and electrophysiological findings had a slowly progressive course (28) while Smith and his co-workers followed a standardized approach to their patients with idiopathic sensory predominant neuropathy and found that only 31% of the patients were truly idioipathic and GTT had the highest diagnostic yield.(29) Another study by Hughes and co-workers found environmental toxin exposure and hypertriglyceridemia but not glucose intolerance or alcohol overuse as significant risk-factors for chronic idiopathic axonal polyneuropathy (30).

Conclusion

To conclude, Diabetes mellitus, entrapment neuropathy and alcohol related neuropathy were the most common causes of neuropathy in this population as was the Idiopathic neuropathy. More studies on large population samples are required so that the profile of peripheral neuropathies is clearer.

References

1. . . . . *BMJ* 2002;324:466-69.
2. England JD, Asbury AK. Peripheral neuropathy. *Lancet* 2004;363:1251-61
3. Yeasmin S, Begum N, Begum S, Hafizur Rahman SM. Sensory neuropathy in hypothyroidism: electrophysiological and clinical findings. *J Bangladesh Society of Physiologist* 2007; 2: 1-6.
4. Chaudhry V, Corse AM, O'Brien R, Cornblath DR, Klein AS, Thuluvath PJ. Autonomic and peripheral (sensorimotor) neuropathy in chronic liver disease: a clinical and electrophysiologic study. *Hepatology* 1999;29:1698-703.
5. Janda K1, Stompór T, Gryz E, Szczudlik A, Drozdz M. Evaluation of polyneuropathy severity in chronic renal failure patients on continuous ambulatory peritoneal dialysis or on maintenance hemodialysis. *Przeglad Lekarski* 2007;64(6):423-30.
6. Koller H, Kieseier BC, Jander S, Hartung HP. Chronic inflammatory demyelinating polyneuropathy. *New Engand Journal of Medicine* 2005;352:1343
7. Busby M1, Donaghy M. Chronic dysimmune neuropathy. A subclassification based upon the clinical features of 102 patients. *J of Neurology* 2003;250(6):714-24.
8. Lopate G, Pestronk A, Al-Lozi M, *et al*. Peripheral neuropathy in an outpatient cohort of patients with Sjogren's syndrome. *Muscle Nerve* 2006;33:672-6
9. Poncelet AN, Connolly MK. Peripheral neuropathy in scleroderma. *Muscle Nerve* 2003;28:330-5.
10. Sivri A, Hascelik Z, Celiker R, Basgoze O. Early detection of neurological involvement in systemic lupus erythematosus patients. *Electromyography&Clinical Neurophysiology* 1995;35:195-9
11. Latinovic1 MC, Gulliford RAC. Incidence of common compressive neuropathies in primary care. *J Neurology Neurosurgery & Psychiatry* 2006 ;77(2):263-5
12. Gaist D, Jeppesen U, Andersen M,*et al*. Statins and risk of polyneuropathy A case-control study. *Neurology* 2002; 14;58(90:1333-7
13. Turgut B, Turgut N, Akpinar S, *et al*. Dorsal sural nerve conduction study in vitamin B(12) deficiency with megaloblastic anemia. *J Peripheral Nervous System* 2006;11(3):247-5
14. Burns TM, Dyck PJ, Aksamit AJ. The natural history and long-term outcome of 57 limb sarcoidosis neuropathy cases. *J Neurological Science* 2006;244:77-87.
15. Chin RL, Sander HW, Brannagan TH, *et al*. Celiac neuropathy. *Neurology* 2003;60:1581-5.
16. Gondim FA, Brannagan TH, Sander HW, *et al*. Peripheral neuropathy in patients with inflammatory bowel disease. *Brain* 2005;128:867-79.
17. Aneja R. Prevalence of peripheral neuropathy in patients with newly diagnosed rheumatoid arthritis. *International J of Rheumatology* 2007;2(2):47-50
18. Raynor EM, Ross MH, Shefner JM, Preston DC. Differentiation between axonal and demyelinating neuropathies: identical segments recorded from proximal and distal muscles. *Muscle & Nerve* 1995;18(4):402-8
19. Beghi E, Monticelli ML, Amoruso L, *et al*. Chronic symmetrical polyneuropathy in the elderly-a field screening investigation in Italian regions. Prevalence and general characteristics of the sample. *Neurology* 1995;45: 1832-6
20. Bharucha NE, Bharucha AE, Bharucha EP. Prevalence of peripheral neuropathy in the Parsi Community of Bombay. *Neurology* 1991; 41: 1315-17.
21. Sase NS, Correia PWM. Clinical profile of peripheral neuropathy: a study of 100 patients. *J Association Physicians of India* 2009; 2: 1-6.
22. Goel HC, Gupta OP, Bajaj S, Saxena RK. Clinical profile and electro diagnostic study of peripheral neuropathy. *J Association Physicians of India* 1989;37(9):578-82.
23. Mygland A, Monstad P. Chronic polyneuropathies in Vest-Agder, Norway. *Eur J Neurol* 2001 ;8(2):157-65
24. Lubec D, Mullbacher W, Finisterer J, Mamoli B. Diagnostic work up in peripheral neuropathy: analysis of 171 cases. *Postgraduate Medicine* 1999; 75: 723-727.
25. Verghese J, Bieri PL, Gellidom D, *et al*. Peripheral neuropathy in young-old and old-old patients. *Muscle and Nerve* 2001;24(11):1476-81
26. Lee HS, Park WS, Koc W, *et al*. Clinical profile of peripheral neuropathies in Korean children. *J Korean Child Neurological Society* 2003; 11(1): 128-134.
27. Vrancken AF1, Franssen H, Wokke JH, *et al*.Chronic idiopathic axonal polyneuropathy and successful aging of the peripheral nervous system in elderly people. *Archives Neurology* 2002 ;59(4):533-40.
28. Jann S, Beretta S, Bramerio M, *et al*. Prospective follow-up study of chronic polyneuropathy of undetermined cause. *Muscle Nerve* 2001;24:1197-1201
29. Smith AG, Singleton JR. The Diagnostic Yield of a Standardized Approach to Idiopathic Sensory-Predominant Neuropathy. *Archives of Internal Medicine* 2004;164(9):1021-1025
30. Hughes RAC, Umapathi T, Gray IA, *et al.* A controlled investigation of the cause of chronic idiopathic axonal polyneuropathy. *Brain* 2004;127(8): 1723-1730