Original Article

Frequency of Peripheral Neuropathy in Chronic Liver Disease

Neuropathy in Chronic Liver Disease

Muhammad Burhan Pasha[1], Muhammad Mumtaz Ather[2], Muhammad Azfar Tanveer[1], Muhammad Asif Yaseen[1], Ali Akram[1] and Nadeem Ullah[3]

ABSTRACT

Objective: Study the magnitude of peripheral neuropathy in chronic liver disease in patients presented in tertiary care centre.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Nishter Hospital Multan in one year duration from May 2018 to May 2019.

Materials and Methods: Ninty patients of diagnosed chronic liver disease were selected irrespective of etiology. Patients were assessed for peripheral neuropathy through electrophysiological methods. Detailed history and clinical examination was taken fromall patients. SPSS software was used for determination of data. Test of significance (t-test and chi square) were applied. P values ≤0.05 was considered as significant.

Results: Sensory nerve conduction as median nerve, ulnar nerve and sural nerve were shown in table II. The mean median nerve as amplitude and NCV was 17.25±2.68 and 41.39±2.12, respectively. The mean ulnar nerve as amplitude and NCV was 14.31±2.15 and 37.24±2.52, respectively. The mean sural verve as amplitude and NCV was 7.26±3.51 and 32.13±4.11, respectively.

Conclusion: Chronic liver disease is associated with peripheral neuropathy; grade of severity of disease increases the incidence of peripheral neuropathy. Advance age group and male gender were also observed associated with greater neuropathy.

Key Words: Peripheral neuropathy, chronic liver disease,

Citation of articles: Pasha MB, Ather MM, Tanveer MA, Yaseen MA, Akram A, Ullah N. Frequency of Peripheral Neuropathy in Chronic Liver Disease. Med Forum 2019;30(8):23-26.

INTRODUCTION

Liver cirrhosis is a major health problem in these days which may ends on several complications and mortality[1]. Cirrhosis may be characterized by hepatic fibrosis. Diagnosis of cirrhosis made on clinical, radiological and laboratory investigations[2]. Prevalence rate of cirrhosis is different in different areas and hepatitis B&C and alcohol use are the main cause of cirrhosis[3]. A list of complications is associated with cirrhosis like hepatic encephalopathy, gastric varices, variceal bleed and esophageal varices. A lot only peripheral but autonomic neuropathy is also associated with cirrhosis[4].

Dayan and William described first time peripheral neuropathy in 1967 in patients of chronic liver disease[5].

[1.] Department of Medicine, NMU, Multan.

[2.] Department of Medicine / Gastroenterology[3], Bakhtawar Amin Medical & Dental College Multan.

Correspondence: Dr. Muhammad Burhan Pasha, Senior Registrar of Medicine, Nishtar Medical University Multan.

Contact No: 03336107231

Email: drburhanpasha@yahoo.com

Received: July, 2019

Accepted: July, 2019

Printed: August, 2019

In this study about 60% patients having sign & symptoms of demylinating peripheral nerve damage like absence of touch and sense of vibration, absence of reflexes also associated[6]. Active demylination was observed on biopsy of sural nerve. Similar damage of nerve ending was found in diabetic patients and alcohol abusers. Neuropathy of alcoholism is acute different from axonal changes of histological history[7]. Peripheral neuropathy in liver cirrhosis and its causes are not established yet.

Peripheral neuropathy develops in male patients is greater than female and this difference is unexplained yet[8,9]. Intensity of disease and chronicity are main contributing features in peripheral neuropathy[10]. Existence of peripheral neuropathy clearly suspected and described in previous literature. This study was planned to investigate the prevalence and pattern of peripheral neuropathy is diagnosed chronic liver disease at tertiary care centres of south Punjab.

MATERIALS AND METHODS

Diagnosed patients of chronic liver disease admitted in Nishter Hospital Multan were selected for study. Study was completed in one year duration from 1st May 2018 to 1st May 2019. Study was started after permission from hospital ethical board. Non probability consecutive sampling technique was used. Informed

written consent was obtained from patients after detailed information and purpose of study.

Clinical examination along with ultrasonographic and laboratory tests were performed for diagnosis of liver cirrhosis. USG evidences include splenomegaly, ascites, nodular or shrunken liver, dilation of portal vein and esophagealvarices on endoscopy. Beyond pedal edema all electrophysiological investigations were performed.

Basic liver tests routine investigation, serum B12 and clinical examination was done for all patients. Electrophysiological tests were performed for sensory and motor neuropathy. Median right ulnar, tibial nerve, common peronal and sural nerve supply was tested. All neurological and liver related findings were noted.

SPSS version was used for determination of mean and standard of numerical variables like age, nerve amplitude. Frequency and percentages were determined for categorical values like presence of neuropathy. Tests of significance (chi square and T tests)were applied. P value less than or equal to 0.05 considered as significant.

RESULTS

Ninety patients were included in this study. The motor nerve conduction results were shown in table I. The mean median nerve as DML, amplitude and NCV of the patients was 4.16±0.49, 6.42±2.31 and 46.50±0.52, respectively. The mean ulnar nerve as DML, amplitude and NCV of the patients was 3.51±0.43, 4.58±0.55 and 46.82±2.44, respectively. The mean common peroneal nerve as DML, amplitude and NCV of the patients was 5.64±1.14, 2.23±0.27 and 40.76±2.05, respectively. While, posterior tibial nerve as DML, amplitude and NCV of the patients was 5.33±2.28, 3.21±1.33 and 37.09±3.07, respectively. (Table. I).

Table No.1: Motor Nerve Conduction

Motor nerve	Parameter	Mean±S.D
Median nerve	DML	4.16±0.49
	Amplitude	6.42±2.31
	NCV	46.50±0.52
Ulnar nerve	DML	3.51±0.43
	Amplitude	4.58±0.55
	NCV	46.82±2.44
Common peroneal nerve	DML	5.64±1.14
	Amplitude	2.23±0.27
	NCV	40.76±2.05
Posterior tibial nerve	DML	5.33±2.28
	Amplitude	3.21±1.33
	NCV	37.09±3.07

Sensory nerve conduction as median nerve, ulnar nerve and sural nerve were shown in table II. The mean median nerve as amplitude and NCV was 17.25±2.68 and 41.39±2.12, respectively. The mean ulnar nerve as amplitude and NCV was 14.31±2.15 and 37.24±2.52, respectively. The mean sural verve as amplitude and NCV was 7.26±3.51 and 32.13±4.11, respectively. (Table. 2).

Table No.2: Sensory Nerve Conduction

Sensory nerve	Parameter	Mean±S.D
Median nerve	Amplitude	17.25±2.68
	NCV	41.39±2.12
Ulnar nerve	Amplitude	14.31±2.15
	NCV	37.24±2.52
Sural nerve	Amplitude	7.26±3.51
	NCV	32.13±4.11

DISCUSSION

Almost all patients of liver cirrhosis develop peripheral neuropathy irrespective of etiology either alcoholic or non alcoholic. Minor variations among both groups were found, may be due to variations in methods of evaluation of neuropathy. Other main cause of this difference was due to the severity of disease;worse disease causes more peripheral neuropathy. In some studies older age was also reported as contributing factor[11].

Kharbanda et al[12] conducted a study on this topic and reported a strong association among neuropathy and liver disease. He observed mild symptoms of neuropathy in 15% of patients but 21% patients have clinical signs of neuropathy in south Indian population. Both sensory and motor abnormalities were observed and assessed in these patients. Magnitude of neuropathy was higher in alcoholic patients as compare to non alcoholics.

Similar findings were observed by Fawiet a[l3] in his study that peripheral neuropathy is associated with liver disease and alcoholic patients have higher magnitude of neuropathy as compare to non alcoholic. In another prospective study conducted by Knill-Jones et al[14]it was found that patients of chronic liver disease with co-morbid disease like diabetes and increased level of antibodies were more prone to neuropathies.

Another study was conducted by Santoro L et al[15] on Italian population and reported higher incidence of neuropathy in untreated hepatitis C patients. He observed hepatitis C infection in 15.3% of patients, this small ratio of cirrhosis may be because of those patients who were included in study but not developed liver cirrhosis yet.

Perretti et al[16] conducted a study on cirrhotic patients and demonstrated decreased amplitude of evoked potential specifically in axonal degeneration and conduction was also slow in these patients. Demylinating sensory and motor response was also observed similar results were also observed in our study. Chaudhry et al[17] also reported similar findings about amplitude and severity of disease as described in

his study that neuropathy increased with increase in severity of disease.

Another similar study was conducted by Jain J et al[18] in 2014 and reported peripheral neuropathy in 53.6% of patients and concluded that peripheral neuropathy is very common in liver cirrhosis patients especially in chronic cases. Result of this study shows that severity of disease is highly associated with increase in peripheral neuropathy.

Hendickseet al[19] reported in his study that peripheral neuropathy is associated with chronic liver disease but there is no relationship between severity of disease and severity of peripheral neuropathy. Cause of peripheral neuropathy was also described by Dayan et al[20]that nerve damage is due to toxic metabolites caused by hepatic disturbance and decreased functioning.

Mittal M et al[21] conducted a study and reported that there neuropathy is not related to nutritional deficit and etiology but cirrhosis is contributing factors and its worse condition is more causative for peripheral neuropathy.

CONCLUSION

Chronic liver disease is associated with peripheral neuropathy; grade of severity of disease increases the incidence of peripheral neuropathy. Advance age group and male gender were also observed associated with greater neuropathy.

Author's Contribution:

Concept & Design of Study:	Muhammad Burhan Pasha
Drafting:	Muhammad Mumtaz Ather, Muhammad Azfar Tanveer
Data Analysis:	Muhammad Asif Yaseen, Ali Akram, Nadeem Ullah
Revisiting Critically:	Muhammad Burhan Pasha, Muhammad Mumtaz Ather
Final Approval of version:	Muhammad Burhan Pasha

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Ahmed S, Payeng D, Das AK. Etiological profile of cirrhosis of liver from north east India with reference to their anti-hepatitis A virus seroprevalence. Oncol, Gastroenterol and Hepatol Reports 2015;4(1):00-00.
2. Joge NP, Kumar V, Verma S, Gupta K, Misra. Vitamin B12 associated peripheral neuropathy in cirrhosis of liver: a cross sectional study, IOSR JDMS 2016;15(12):73-77.
3. Scaglione S, Kliethermes S, Cao G, Shoham D, Durazo R, Luke A, et al. The epidemiology of cirrhosis in the United States: a population-based study, J Clin. Gastroenterol 2015; 49(8):690-6.
4. Clarkea M, Benmoussaa J, Penmetsaa AB. inaccuracies of hemoglobinA1c in liver cirrhosis: A Case Report. J Endocrinol Metab 2016;6(1):30-2.
5. Adinolfi LE, Nevola R, Lus G, et al. Chronic hepatitis C virus infection and neurological and psychiatric disorders: an overview. World J Gastroenterol 2015;21(8):2269–80.
6. Cacoub P, Comarmond C, Domont F, Savey L, Desbois AC, Saadoun, D. Extrahepatic manifestations of chronic hepatitis C virus infection. Therapeutic Advances in Infectious Dis, 2016;28:3–14.
7. Dalton HR, Kamar N, van Eijk JJ, Mclean BN, Cintas P, Bendall RP. Hepatitis E virus and neurological injury. Nat Rev Neurol 2016; 12(2):77-85.
8. Gill K, Ghazinian H, Manch R, Gish R. Hepatitis C virus as a systemic disease: reaching beyond the liver. HepatolInt 10(3):415–23.
9. Dedania B, Wu GY. Dermatologic extrahepatic manifestations of Hepatitis C. J Clin Transl Hepatol 2015;3:127–133.
10. Boscarino JA, Lu M, Moorman AC, et al. Predictors of poor mental and physical health status among patients with chronic hepatitis C infection: the Chronic Hepatitis Cohort Study (CHeCS) Hepatol 2015;61:802–811.
11. Bhave SA, Pandit AN, Pradhan AM, Sidhaye DG, Kantarjian A, Williams A, et al. Liver disease in India. Arch Dis Child 1982;57:922-8.
12. Kharbanda PS, Prabhakar S, Chawla YK, Das CP, Syal P. Peripheral neuropathy in liver cirrhosis. J Gastroenterol Hepatol 2003;18:922-6.
13. Fawi GH, Khalifa GA, LA D. Autonomic and peripheral neuropathies in chronic liver diseases: Clinical and neurophysiological study. Egypt J Neurol Psychiatr Neuro Surg 2005;42:87-200.
14. Knill-Jones RP, Goodwill CJ, Dayan AD, Williams R. Peripheral neuropathy in chronic liver disease: Clinical, electrodiagnostic, and nerve biopsy findings. J Neurol Neurosurg Psychiatr 1972;35:22-30.
15. Santoro L, Manganelli F, Briani C, Giannini F, Benedetti L, Vitelli E, et al. Prevalence and characteristics of peripheral neuropathy in hepatitis C virus population. J Neurol Neurosurg Psychiatr 2006;77:626-9.

16. Perretti A, Gentile S, Balbi P, Persico M, Caruso G. Peripheral neuropathy in liver cirrhosis. A clinical and electrophysiological study. Ital J Gastroenterol 1995;27:349-54.
17. Chaudhry V, Corse AM, O′Brian R, Cornblath DR, Klein AS, Thuluvath PJ. Autonomic and peripheral (sensorimotor) neuropathy in chronic liver disease: A clinical and electrophysiologic study. Hepatol 1999; 29:1698-703.
18. Jain J, Singh R, Banait S, Verma N, Waghmare S. Magnitude of peripheral neuropathy in cirrhosis of liver patients from central rural India. Ann Indian Acad Neurol 2014;17:409-15.
19. Hendrickse MT, Thuluvath PJ, Triger DR. Natural history of autonomic neuropathy in chronic liver disease. Lancet 1992;339(8807):1462-4.
20. Dayan AD, Williams R. Demyelinating peripheral neuropathy and liver disease. Lancet. 1967;2: 133-4.
21. Mittal M, Singh PV, Kurian S. Study of prevalence and pattern of peripheral neuropathy in patients with liver cirrhosis. Int J Adv Med 2017;4:1041-5.