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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.822717>Available online at: <http://www.iajps.com>**Research Article****PERIPHERAL NEUROPATHY AMONG SUFFERERS OF  
LIVER CIRRHOSIS**Najeeb Ullah Ansari<sup>1</sup>, Sunil Dat Maheshwari<sup>2\*</sup>, Ashok Kumar Lohano<sup>3</sup><sup>1</sup>Bilawal Medical College, Jamshoro, Sindh, Pakistan.<sup>2</sup>Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan.<sup>3</sup>Peoples University of Medical & Health Sciences for Women, Nawabshah-Shaheed Benazirabad, Sindh, Pakistan.**Abstract:****Objective:** To determine the peripheral neuropathy among sufferers of liver cirrhosis**Methodology:-** This was a observational cross sectional study, conducted at Ward 7 (MU-III), Jinnah Postgraduate Medical Center (JPMC), Karachi for Six months from 10th February 2016 to 9th August 2016. Total 195 patients of liver cirrhosis of more than 5 years duration with Child Pugh (A,B,C) were encompassed in the study using the purposive sampling technique. Nerve conductivity testing with surface electrodes was carried out in all four limbs including motor and sensory fibers of ulnar, median, tibial, and peroneal nerves as well as in sensory fibers of sural nerve. PN was diagnosed if more than one peripheral nerve was affected on nerve conduction study.**Results:** There were 119 male and 76 female patients with mean age of 45.19±8.41 yrs. The mean duration of disease was 8.85±1.69 years, with range 5(6–11) years. The child pugh class of 29.2% were class-A, 26.7% were class-B, and 44.1% were class-C. The peripheral neuropathy was observed in 59% patients. No any statistically significant association was observed with gender, age, child pugh class, and duration of disease.**Conclusion:** This study concluded that peripheral neuropathy is a possible complication of liver cirrhosis irrespective of etiology. The neuropathy was more prevalent in male gender, age >45 years and duration of disease 9-11 years.**Keywords:** Prevalence, Peripheral Neuropathy, Liver Cirrhosis.**Corresponding author:****Sunil Dat Maheshwari,**

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**INTRODUCTION:**

Cirrhosis of liver shares a huge burden of morbidity and mortality throughout the globe [1]. Routine clinical or laboratory examination reveals cirrhosis in as many as 40% of sufferers who remain silent without a single symptom. In our hospital, the patients of cirrhosis presented usually with serious and life-threatening complications like encephalopathy, ascites, and gastrointestinal bleed [1-3]. Most studies focused on portal hypertension, variceal bleeding, overt hepatic encephalopathy, while complication like peripheral neuropathy (PN) were seldom studied. Dayan and Williams were the founders of relationship of PN and cirrhosis [4]. Peripheral neuropathy need to be focused as it is important complication of cirrhosis of liver that may seriously impair patient's routine daily activities and quality of life [5,6].

It is stated that peripheral neuropathy has a momentous association with both liver cirrhosis and chronic hepatitis and is more marked with advanced liver disease [7]. However, only few hepatologist really screen patients for Peripheral neuropathy due to time-consuming neurophysiological tests [8] and controversies in literature about the presence of peripheral neuropathy in liver cirrhosis [9]. Chari VR et. al. discovered PN in 63.3% and 16.6% in cirrhotic and chronic hepatitis respectively. Further elaboration revealed 33.3% with abnormal conduction velocities and 80% with demyelination in patients with hepatic cirrhosis and in cases with chronic hepatitis, 41.6% were with abnormal conduction velocity and 75% with segmental demyelination [10]. Jain et al found peripheral neuropathy in 111 out of 207 (53.6%) of the study subjects with cirrhosis of liver [11]. Santoro et al. found the prevalence of peripheral neuropathy to be 15.3% [12]. Kharbanda et al found it to be 73% [13].

As various studies revealed variable prevalence of peripheral neuropathy varying from 19-80% in the cirrhotic patients on nerve conduction studies. Current study would help to establish the local perspective as there is paucity of local data. Thereby regular screening of suspected patients would help identify the problem so that timely intervention can be done to prevent adverse outcome as already cirrhosis of liver poses a huge financial and psychological burden for the patients and their families. Since treatment regimens are limited early diagnosis of is the most effective approach especially in resource restrained settings [14].

**MATERIAL AND METHODS:**

This was an observational cross-sectional study conducted at ward 07(MUIII), Jinnah Hospital, Karachi from 10th February 2016 to 9th August 2016. Total 195 patients via Descriptive purposive

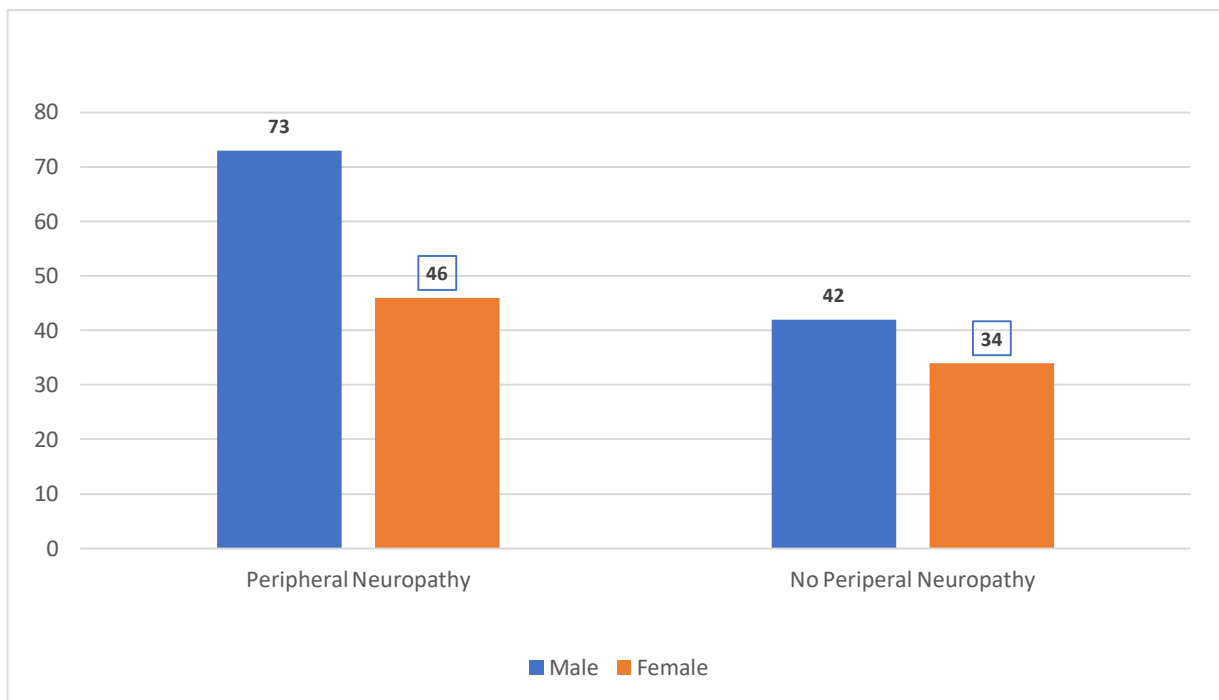
sampling technique based on the formula of fixed proportions keeping in view of 53.6% prevalence of peripheral neuropathy in liver cirrhosis calculated through WHO Software was selected with a 95% CI (confidence interval) and 7% error margin. Consented patients with cirrhosis had included from outdoor facilities on the basis of inclusion and exclusion criteria. Diagnosed patient of liver cirrhosis of more than 5 years duration with Child Pugh (A,B,C) of either gender but age between 30-60 years were included. Non-consenting, Known hypertensive, patients with history of diabetes mellitus or alcohol consumption or Vitamin B 12 deficiency having level < 150 mg/L, Gullian-Barre Syndrome, leprosy, vesicular dermatosis, allergic contact dermatitis were in exclusion. After brief history regarding sociodemographic data and diseases duration, a trained technician performed the nerve conduction velocity in both arms (Median, Ulnar and Radial nerve's both efferent and afferent fibers) and legs (Sural nerve's afferent fibers). PN was diagnosed in patients with >1 peripheral nerve involvement. Structured proformas were utilized to maintain and assemble the recordings and data. Data analysis was achieved by SPSS 16.

**RESULTS:**

**195** cases were included in the study from which **119(61.02%)** were male and **76 (38.9%)** female. The mean age **45.19±8.41** years, range 30(30–60) years which was stratified in two groups. Age of **102 (52.3%)** patients was ≤45 years and age of **93(47.7%)** patients was >45 years. The mean duration of disease was **8.85±1.69** years, with range 5(6–11) years which was stratified in two groups. The duration of **72 (36.9%)** patients was 5-8 years and **123 (63.07%)** patients were 9-11 years. Majority **86(44.1%)** were in child pugh C while **57 (29.2%)** and **52(26.7%)** were in A and B respectively. **124(63.6%)** patients were smokers i.e. they had history of more than 1 pack year of smoking.

Peripheral neuropathy was observed in **115(59.0%)** patients from which **73 (63.4%)** were male patients and **42 (36.5%)** were female. "Figure 1" The descriptive statistics of age and duration of disease according to peripheral neuropathy were calculated. It was observed that mean age of patients with peripheral neuropathy was **45.27±7.88** years while mean duration of disease was **8.75±1.69** years. "TABLE 1"

Stratification with respect to smoker, duration of disease and child pugh class was done to observe association of these modifiers with peripheral neuropathy. Post stratification, chi square test results revealed that no significant association ( $p>0.05$ ) with smoking (0.064), duration of disease ( $p=0.643$ ) and child pugh class (0.863). "TABLE 2".



**Fig 1: Frequency or Percentage of Cirrhotic Patients According To Peripheral Neuropathy (n=195)**

**Table 1: Descriptive Statistics of Gender, Age (years) and Duration of Disease according To Peripheral Neuropathy (n=195)**

	PERIPHERAL NEUROPATHY	
	PRESENT (n=115)	ABSENT (n=80)
<b>AGE (Mean <math>\pm</math>SD)</b>	45.27 $\pm$ 7.88	45.09 $\pm$ 18
<b>DURATION OF DISEASE (Mean <math>\pm</math>SD)</b>	8.75 $\pm$ 1.69	8.99 $\pm$ 1.70

**Table 2: Frequency and Association of Smoker, Duration of Disease and Child Class According to Peripheral Neuropathy (n=195)**

	PERIPHERAL NEUROPATHY		TOTAL	P VALUE
	PRESENT (n=115)	ABSENT (n=80)		
<b>SMOKER</b>				
<b>YES</b>	67	57	124	0.064
<b>NO</b>	48	23	71	
<b>DURATION OF DISEASE</b>				
<b>5-8 years</b>	44	28	72	0.064
<b>9-11 years</b>	71	52	123	
<b>CHILD CLASS</b>				
<b>Clas-A</b>	34	23	<b>57</b>	0.863
<b>Class-B</b>	32	20	<b>52</b>	
<b>Class-C</b>	49	37	<b>86</b>	

**DISCUSSION:**

The involvement of nervous system central, peripheral or autonomic is common in liver cirrhosis [15]. Many studies support the fact that PN is the complication of liver diseases but mechanism is yet controversial [10,16,17]. According to some studies there is no such complication while some agree that it is a subclinical complication but no one described the characterization of PN [10,18]. PN need to be focused as it is important complication of cirrhosis of liver that may seriously impair patient's routine daily activities and quality of life.

In our study, liver cirrhosis of more than 5 years duration and child Pugh class (A,B,C), were studied to determine peripheral neuropathy. The mean age of 45.19±8.41 years were evaluated. Most of the patients were male 73(61.34%) rather than female 42(55.26%) and most had disease for more than 10 years. Peripheral neuropathy was observed in 115(59.0%) patients with mean age of 45.27±7.88 years and mean duration of disease 10.61±2.99 years. Child pugh class-C was the most prevalent (44.1%) and most of the patients (63.6%) were smoker. The duration of disease in 63.07% was 9-11 years and 36.9% was 5-8 years. No significant association of peripheral neuropathy was observed with smoking, duration of disease and child pugh class.

A study done by Kharbanda PS *et al.*, analyzing 33 patients with cirrhosis of liver shows mild symptoms due to neuropathy in 5 (15%) patients while clinical signs were present in 7(21%) patients. Sensory impairment was present in 4(12%), motor weakness in 2(6%), and 5(15.1%) with loss deep tendon reflexes [13].

However, results from study done by Kharbanda *et al.*<sup>13</sup> and Fawi *et al.*, [15] concluded that PN is very common irrespective of the etiology of liver disease. Earlier study on nerve biopsies showed, xanthomatous deposits in nerves leading to mechanical derangement in alcoholics. Although alcohol use can independently cause neuropathy, in this study, subjects who did not have alcohol as a cause for development for cirrhosis of liver also had polyneuropathy.

In a prospective clinical study conducted on cirrhosis of liver patients by Knill-Jones *et al.*, PN was associated with diabetes mellitus, increased levels of immunoglobulin A (IgA) and IgM and not with etiology of cirrhosis.<sup>19</sup> However we have excluded patients with DM from our study.

Jain J *et al.* states that the magnitude of PN was higher among smoker compared to those who never

smoked and odds was 2.27 (95%, CI: 1.10-4.65) was significant ( $P = 0.025$ ). The possible explanation for this could be patients who smoke also drink alcohol also. However other personal habits like tobacco chewing, pan chewing and betel nut chewing were not associated with PN [11].

The cirrhotic patients in a study were divided into three classes (A, B, and C) according to the severity of disease based on modified CP Score. Nerve conduction study values were not significantly different in three classes when compared. Odds of PN were not significant for both CP score B, C (OR = 1.26-1.98;  $P = 0.242$ ). Results of this study were similar to Kharbanda *et al.*, [13] Knill-Jones *et al.*, [19] and Fawi *et al.*, [15] studies. These observations suggest that the possible causes of PN in study subjects of cirrhosis of liver might be injury to hepatic parenchyma and deranged metabolism leading to accumulation of substances which cause nerve damage.

**CONCLUSION:**

Very few hepatologist screen patients for Peripheral neuropathy due to time-consuming neurophysiological tests and association controversies. This research concluded that peripheral neuropathy is one of the complications of liver cirrhosis irrespective of its etiology and is more prevalent in male gender, age > 45 years, and duration of disease 9-11 years.

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