

**Research Article**

**Evaluation of dyslipidemia in cases of liver cirrhosis**

**<sup>1</sup>Qazi Waleed Hussain, <sup>2</sup>Amina Tahir  
and <sup>3</sup>Qazi Maaz Hussain**

<sup>1</sup>Medical officer, THQ hospital Darya Khan district Bhakkar

<sup>2</sup>Incharge Medical Officer, Bhu 553/ E.B Dist.VEHARI

<sup>3</sup>Medical officer, DHQ Hospital Bhakkar district Bhakkar

**ABSTRACT:**

**Objectives:** To evaluate dyslipidemia in cases of liver cirrhosis.

**Methods:** This cross sectional study was conducted at Department of Medicine, THQ Hospital Darya Khan District Bhakkar from January 2017 to June 2017. Total 200 cases of liver cirrhosis were selected.

**Results:** In present study, mean age of the patients was  $39.65 \pm 12.45$  years. Dyslipidemia was found in 168/200 (84%) patients. Significant association of dyslipidemia with severity of liver cirrhosis was noted.

**Conclusion:** Results of this study reveals that dyslipidemia was found frequently in patients of liver cirrhosis. Dyslipidemia worsens with severity of liver cirrhosis according to child Pugh classification. But has no statistically significant association with age and gender.

**KeyWords:** Child pugh class, liver cirrhosis, dyslipidemia, lipid profile, Hepatitis, Hepatitis B, Hepatitis C

**INTRODUCTION**

Cirrhosis of liver is defined as a chronic disorder of liver characterized by degeneration of liver cells followed by fibrosis and disordered regenerating nodules leading to portal hypertension and its complications.<sup>1</sup> In 2001 cirrhosis liver was the 10<sup>th</sup> leading cause of death in men and 12<sup>th</sup> for women in the United States resulting in about 27,000 deaths.<sup>1</sup> In developing countries like Pakistan cirrhosis liver is more prevalent compared to developed countries.<sup>2</sup> In fact both hepatitis B virus (HBV) and hepatitis C virus (HCV) infections have become endemic in our community.<sup>3</sup> About 2-3% individuals of world's population infected by Hepatitis C.<sup>4</sup> Chronic alcoholic liver disease accounts for 40% of deaths due to cirrhosis of liver. For the management of cirrhosis of liver and its

complications, such patients need frequent hospital visits. Child pugh classification is used to predict survival in patients with cirrhosis.<sup>5</sup>

Lipids are one of the necessary components which control cellular functions and homeostasis. Liver plays an essential role in lipid metabolism, several stages of lipid synthesis and transportation.<sup>7</sup> Therefore, it is reasonable to expect an abnormal lipid profile in those with severe liver dysfunction. There is prominent decline in plasma cholesterol and triglyceride (TG) levels in patients with severe hepatitis and hepatic failure because of reduction of lipoprotein biosynthesis. For reduced liver biosynthesis capacity, low levels of TG and cholesterol is usually observed in chronic liver diseases.<sup>8</sup> Although several studies have been done on dyslipidemia in cirrhotics worldwide

there is a paucity of data in this regard in our local population. So a study was conducted to determine overall frequency or magnitude of dyslipidemia in cirrhosis and the mean lipid profile values in liver cirrhosis as there is a high prevalence of chronic liver disease in Pakistan. Also etiology of chronic liver disease as well as dietary factors are different in our country as compared to the developed countries. The results of this study will help in making protocols for screening dyslipidemias in cirrhotic.

#### **MATERIAL AND METHODS:**

This cross sectional study was conducted at Department of Medicine THQ Hospital Darya Khan District Bhakkar from January 2017 to June 2017. Total 200 patients of liver cirrhosis either male or female and having age from 15-65 years were recruited. An approval was taken from institutional review committee before commencing the study and written informed consent was taken from every patient.

Patients with co-morbid diseases such as diabetes mellitus, hypertension and ischemic heart disease, patients on lipid lowering drugs or hepatotoxic drugs, patients with acute hepatitis, patients with end stage renal disease were excluded from the study. Presence of all was labeled as liver cirrhosis; Liver cirrhosis defined as: patients with deranged liver function tests, serum bilirubin > 2.0 mg/dl, presence of yellowness of sclera, ascites on clinical examination, evidence of shrunken liver and splenomegaly on ultrasonography.

Presence of any one was labeled as dyslipidemia; When fasting lipid profile (after an overnight fast of 12 hours) is outside the following range (Triglycerides <150 mg/dl, HDL <40 mg/dl, LDL 100 – 129 mg/dl, total Cholesterol <200 mg/dl). Fasting blood samples of all the patients were taken and sent to laboratory for lipid profile and findings were noted on pre-designed proforma along with demographic profile of the patients.

**Fig. 1:** Frequency of Dyslipidemia

All the collected data was entered and analyzed by using SPSS version 16. Mean and standard deviation was calculated for numerical variables and frequencies and percentages was calculated for categorical variable. Chi-square/fisher exact test was applied to see the level of significance. P. value  $\leq 0.05$  was considered as statistically significant.

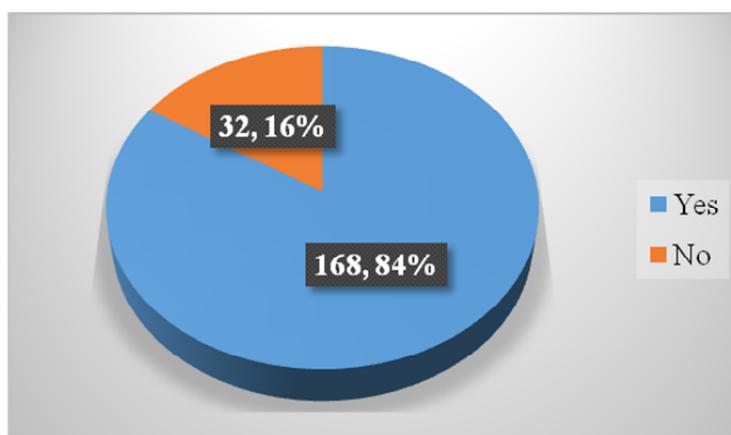
#### **RESULTS:**

In present study mean age of the patients was  $39.65 \pm 12.45$ . Dyslipidemia was noted in 168/200 (84%) patients. Total 120/200 (60%) were males and 80/200 (40%) were females. Dyslipidemia was in 100/120 (83.33%) male patient 68/80 (85%) female patients. Insignificant ( $P = 0.8450$ ) association of gender with dyslipidemia was noted. Table 1.

Age distribution of the patients was done and two groups were made, age group 15-40 years and age group 41-65 years. In age group 15-40 years, out of 107/200 (53.5%) patients, dyslipidemia was noted in 89/107 (83.18%) patients. Out of 93/200 (46.5%) patients of age group 41-65 years, dyslipidemia was noted in 79/93 (84.95%) patients. Insignificant ( $P = 0.8472$ ) between age of the patients and dyslipidemia was noted. Table 2. Distribution of patients according to the severity of liver cirrhosis was done. Total 40/200 (20%) patients were found with mild liver cirrhosis followed by 58/200 (29%) moderate and 102/200 (51%) with moderate liver cirrhosis. Dyslipidemia was found in 13/40 (33.5%) patients with mild liver cirrhosis, 53/58 (91.38%) moderate liver cirrhosis and 102/102 (100) with severe liver cirrhosis.

Statistically significant ( $P = 0.000$ ) association of severity of liver cirrhosis with dyslipidemia was noted. Table 3

Evaluation of dyslipidemia in cases of liver cirrhosis



**Table 1:** Gender distribution of the patients

Gender	Dyslipidemia		Total (%)	P. value
	Yes (%)	No (%)		
Male	100 (83.33)	20 (16.67)	120 (60)	0.8450
Female	68 (85)	12 (15)	80 (40)	
<b>Total</b>	<b>168</b> <b>(84)</b>	<b>32</b> <b>(16)</b>	<b>200</b>	

**Table No.2:** Age distribution of the patients

Age Group	Dyslipidemia		Total (%)	P. value
	Yes (%)	No (%)		
15-40	89 (83.18)	18 (16.82)	107 (53.5)	0.8472
41-65	79 (84.95)	14 (15.05)	93 (46.5)	
<b>Total</b>	<b>168</b> <b>(84)</b>	<b>32</b> <b>(16)</b>	<b>200</b>	

**Table No.3:** Distribution of patients according to severity of liver cirrhosis

Severity of live cirrhosis	Dyslipidemia		Total (%)	P. value
	Yes (%)	No (%)		
Mild	13 (33.5)	27 (67.5)	40 (20)	0.000
Moderate	53 (91.38)	5 (8.62)	58 (29)	
Severe	102 (100)	0	102 (51)	
<b>Total</b>	<b>168</b> <b>(84)</b>	<b>32</b> <b>(16)</b>	<b>200</b>	

**DISCUSSION:**

Liver plays a vital role in lipid metabolism. It contributes both in exogenous and endogenous cycles of lipid metabolism and transport of lipids through plasma. Lipids are essential component of

biological membranes, free molecules and metabolic regulators that control cellular function and homeostasis. Synthesis of many apolipoproteins takes place in liver. The apolipoproteins are required for the assembly and

structure of lipoproteins. Lipoproteins play an important role in the absorption of dietary cholesterol, long chain fatty acids and fat soluble vitamins. Liver is the principal site of formation and clearance of lipoproteins. This shows liver is involved in many steps of lipid metabolism and lipid transport. Thus in severe liver disease, lipid metabolism is profoundly disturbed.<sup>9,10</sup>

In present study dyslipidemia was observed in 84% patients of liver cirrhosis. Most of them belonged to middle age group and the mean age was found  $39.65 \pm 12.45$  years. Among the age 15 to 40 years, dyslipidemia was found in 83.18% patients while in age group 41-65 years, dyslipidemia was found in 84.95% patients. These finding of dyslipidemia comparable with the study of Roesch-Dietlen et al<sup>11</sup> which was showing dyslipidemia as 76.92% but Shimizu H<sup>12</sup> at Ohio USA found lower dyslipidemia rate as 61% in patients of liver cirrhosis.

Cirrhotic patients need frequent visits and multiple hospitalizations for management of cirrhosis or its complications. However, choosing the proper treatment plan depends on the severity, type of liver damage and possibility of assessing its extent. To evaluate cirrhosis, Child-Turcotte-Pugh criteria can be used.<sup>10</sup>

Severity of the liver cirrhosis as according to child pugh class dyslipidemia occurred more in severely affected ones. Here in our study almost 100% severely affected patients had dyslipidemia. Spostiet al<sup>13</sup> also found that there was a positive correlation between Child Paugh classification of each group (A, B, C) and the HDL-c: Apo A1 ratio and liver function. The differences in the HDL-c: Apo A1 ratio between the groups A and C, and the groups B and C were statistically significant. In a study conducted by EL-Khabbany ZA,<sup>14</sup> It was concluded that dyslipidemia is a frequent finding in a patient with chronic liver disease, which worsened with increased severity of CLD. Of the 40 studied cases with CLD, 8(20%) had hypercholesterolemia, 13(32.5%) had hypertriglyceridemia, 17(42.5%) had low HDL and 9(22.5%) had high LDL.<sup>14</sup>

Abbas et al<sup>15</sup> also found that hypocholesterolemia is a common finding in decompensated chronic liver disease and has got significant association with Child-Pugh class. As severity of liver dysfunction increased these levels decreased proportionately. Results also revealed that males were more hypocholesterolemic than females.<sup>15</sup>

Our study is indoor study on hospitalized patients. Chronic liver disease is one of the highly prevalent disease in our community. Dyslipidemia also contributes for its morbidity and mortality as commonly observed in them. Its effective screening and prompt management may helpful in decreasing morbidity and mortality of chronic liver disease. It is suggested to perform further studies in this aspect particularly community based, so that results will be more generalized.

#### CONCLUSION:

Results of this study reveal that dyslipidemia was found frequently in patients of liver cirrhosis. Dyslipidemia worsens with severity of liver cirrhosis according to child Pugh classification. But has no statistically significant association with age and gender.

#### REFERENCES:

1. Anderson RN, Smith BL. "Deaths: leading causes for 2001". National vital statistics reports: from the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System 2003;52:1-85.
2. Ullah F, Khan S, Afridi AK. Frequency of different Causes of Cirrhosis Liver in local population. Gomal Journal of Medical Sciences [Internet]. 2012 [cited 2014 Mar 6];10(2). Available from: <http://gjms.com.pk/ojs786/index.php/gjms/article/view/773>.
3. Hamid S, Tabassum S, Jafri W. Hepatitis C has replaced hepatitis B as major cause of chronic liver disease in Pakistan. Hepatology 1990; 30:212.

4. Bostan N, Mahmood T. An overview about hepatitis C: a devastating virus. *Crit Rev Microbiol.* 2010;36(2):91-133.
5. Bacon BR. Cirrhosis and its complications. In: Fauci, Braunwald, Kasper, Hauser, Lango, Jamson, editor, et al. *Harrison's Principles of Internal Medicine.* New York: McGraw Hill; 2008. P. 1971-80.
6. Ghany M, Hoofnagle JH. Approach to patients with liver disease. In: Fauci, Braunwald, Kasper, Hauser, Lango, Jamson, editor, et al. *Harrison's Principles of Internal Medicine.* New York: McGraw Hill; 2008. P. 1918-23.
7. Ghadir MR, Riahin AA, Havasupai A, Nooranipour M, Habibinejad AA. The relationship between lipid profile and severity of liver damage in cirrhotic patients. *Hepat Mon* 2010;10(4):285-8.
8. Halsted CH. Nutrition and alcoholic liver disease. *Semin Liver Dis.* 2004;24(3):289-304.
9. Xu W, Liu W, Shao X, Jiang G, Li X. Effect of Trichlorfon on Hepatic Lipid Accumulation in Crucian Carp *Carassius auratus gibelio*. *J AquatAnim Health.* 2012 Sep;24(3):185-94.
10. Mehboob F, Ranjha FA, Masud S. Changes in Serum Lipid Profile Among Patients Suffering From Chronic Liver Disease. *Annals of King Edward Medical University* [Internet]. 2010 [cited 2014 Jul 15];13(3). Available from: <http://www.annalskemu.org/journal/index.php/annals/article/viewArticle/113>.
11. Roesch-Dietlen F, Pérez-Morales A, Melo-Santisteban G, Díaz-Blanco F, Martínez-Fernández S, Martínez JA, et al. [Frequency and clinical, biochemical and histological characteristics of nonalcoholic fatty liver disease in patients with gallstone disease]. *Cir Cir.* 2008 Feb;76(1):37-42.
12. Shimizu H, Phuong V, Maia M, Kroh M, Chand B, Schauer PR, et al. Bariatric surgery in patients with liver cirrhosis. *Surgery for Obesity and Related Diseases.* 2013 Jan;9(1):1-6.
13. Sposito AC, Vinagre CG, Pandullo FL et al. Apolipoprotein and lipid abnormalities in chronic liver failure. *Braz J Med Biol Res.* 1997; 30: 1287-90.
14. EL-Kabbany ZA, Hamza RT, Ibrahim SA, Mahmoud NH. Dyslipidemia and hyperinsulinemia in children and adolescents with chronic liver disease: relation to disease severity. *Int J Adolesc Med Health* 2013;2:1-7.
15. Abbasi A, Bhutto AR, Butt N, Lal K, Munir SM. Serum cholesterol: could it be a sixth parameter of Child-Pugh scoring system in cirrhotic due to viral hepatitis? *J Coll Physicians and Surg Pak* 2012;22(8):484-7.