CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3246499

Available online at: http://www.iajps.com ***Research Article***

ANALYSIS OF FREQUENCY OF LOW SERUM FERRITIN LEVEL IN PATIENTS OF DECOMPENSATED CHRONIC LIVER DISEASE

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Article Received: April 2019 **Accepted:** May 2019 **Published:** June 2019

Abstract:

Introduction: *In Pakistan more, people die of liver disease due to chronic hepatitis every day than terrorism in a year.*

Aims and objectives: *The main objective of the study is to analyse the frequency of low serum ferritin level in patients of decompensated chronic liver disease.*

Material and methods: *This cross-sectional study was conducted in Aziz Bhatti Shaheed Teaching Hospital, Gujrat during May 2018 till November 2018. The data was collected from 100 patients. All adult and middle age 20-60 years patients of both genders diagnosed case of chronic liver disease (previously or recently diagnosed having features of decompensated disease) were included in the study. After clinical examination, the diagnosis of chronic liver disease was made. After taking all aseptic measures blood was taken and stored in a serum bottle.*

Results: *The data was collected from 100 patients. Mean age (years) in the study was 53.74±8.66 with ranges from 20 to 60 years. Distribution of gender of patient was also calculated in terms of frequency and percentage of male and female patients. There were 03 (1.8) patients have low serum ferritin level (< 20 ng/ml) and decompensated chronic live disease secondary to hepatitis C virus infection. Similarly, descriptive statistics of serum ferritin (ng/ml) of patient was also calculated in terms of mean and standard deviation. Mean serum ferritin level in the study was 200.33±196.97.*

Conclusion: *It is concluded that elevated serum ferritin worsened liver injury. Hence it represents early marker for the severity of chronic liver disease, related both to the degree of liver fibrosis and to the inflammatory activity.*

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Please cite this article in press Muhammad Asad Butt et al., ***Analysis Of Frequency Of Low Serum Ferritin Level In Patients Of Decompensated Chronic Liver Disease.,*** *Indo Am. J. P. Sci, 2019; 06[06].*

INTRODUCTION:

In Pakistan more people die of liver disease due to chronic hepatitis every day than terrorism in a year. Pakistan carries the world's highest burdens of end stage liver disease and mortality due to liver failure and hepatocellular carcinomas (HCC). Among Hepatitis, Hepatitis C Virus (HCV) is one of the commonest causes of chronic liver disease in Pakistan. In Pakistan 10 million people are presumed to be infected with HCV and according to W.H.O Pakistan is in 2nd position in prevalence of Hepatitis C after Egypt [1]. There are approximately 1 million chronic carriers of hepatitis B and 1.7 million chronic carriers of hepatitis C in Sind province of Pakistan.

Iron deficiency anemia is a frequent manifestation in patients with liver cirrhosis. It results from gastrointestinal bleeding from peptic ulcers or oesophageal varices, along with haemostatic defects of chronic liver disease [2]. A study conducted in sreebalaji medical college and hospital from 2011 to 2013, that showed 86 (100) 86% patients with liver cirrhosis had anemia, of which 28% had iron deficiency anemia, diagnosed by ferritin level. Both storage and utilization of serum iron in decompensate chronic liver disease is impaired, so serum iron is not a good marker to diagnose iron deficiency anemia in patients with liver cirrhosis [3].

As mentioned previously that storage and utilization of serum iron in chronic liver disease is impaired and serum iron is not a good marker to diagnose iron deficiency anemia in patients with liver cirrhosis. It is serum ferritin that can be used to diagnose iron deficiency anemia in patients with chronic liver disease due to hepatitis C. Camelia et al. showed that 3 (3.5**%)** patients with chronic liver disease due to hepatitis C, had low levels of serum iron with 8 (9.4%) patients had low serum ferritin level [4].

Several studies reported that elevated serum ferritin worsened liver injury. Hence it represents early marker for the severity of chronic liver disease, related both to the degree of liver fibrosis and to the necroinflammatory activity [5]. Massive iron supplements therapy in patients already having high ferritin level may further induce liver injury. It is mandatory to check serum ferritin level in order to diagnose iron deficiency anemia in patients with chronic liver disease due to hepatitis C in order to prevent judicious use of iron supplements. Iron supplements can only be given if serum ferritin is low [6].

AIMS AND OBJECTIVES:

The main objective of the study is to analyse the frequency of low serum ferritin level in patients of decompensated chronic liver disease.

MATERIAL AND METHODS:

This cross sectional study was conducted in Aziz Bhatti Shaheed Teaching Hospital, Gujrat during May 2018 till November 2018. The data was collected from 100 patients. All adult and middle age 20-60 years patients of both genders, diagnosed case of chronic liver disease (previously or recently diagnosed having features of decompensated disease) were included in the study. After clinical examination, the diagnosis of chronic liver disease was made. After taking all aseptic measures blood was taken and stored in a serum bottle. The bottle was clearly marked with the name and hospital number of the patients. The serum bottle was send to the hospital laboratory in order to check serum iron, ferritin, TIBC, and LFT, s. The sample was send to the hematology department in order to check for the serum iron and ferritin reports were verified by consultant. The results were recorded on proforma accordingly.

STATISTICAL ANALYSIS:

The data was analyzed by SPSS software version 16. Descriptive statistics was calculated for all variables like age, gender, low serum ferritin. Descriptive analysis was used for measuring mean, standard deviation for numerical variables like age, hemoglobin, MCV, serum ferritin.

RESULTS:

The data was collected from 100 patients. Mean age (years) in the study was 53.74±8.66 with ranges from 20 to 60 years. Distribution of gender of patient was also calculated in terms of frequency and percentage of male and female patients. There were 03 (1.8) patients have low serum ferritin level (< 20 ng/ml) and decompensated chronic live disease secondary to hepatitis C virus infection. Similarly, descriptive statistics of serum ferritin (ng/ml) of patient was also calculated in terms of mean and standard deviation. Mean serum ferritin level in the study was 200.33±196.97.

Table 01: Descriptive statistics of Serum Ferritin ng/ml

	n	Minimum	Maximum	Mean	Std. Deviation
Serum Ferritin (ng/ml)	165	5.79	1297.00	200.33	196.97

Table 02: Effect modifier like Age stratification with low Serum Ferritin (< 20 ng/ml)				
		Low Serum Ferritin level (< 20 ng/ml)		P-value
		yes	no	
Age group	20 - 50 years	0	51	0.242
		0.0%	31.5%	
	50 - 60 years	3	111	
		100.0%	68.5%	
Total		**3**	**162**	
		100.0%	**100.0%**	

DISCUSSION:

The mechanisms of hepatic iron overload in CHepC have not yet been elucidated. However, hepcidin has attracted much attention as an important factor in the disease process. Hepcidin is exclusively produced in the liver and regulates body iron stores [7]. Hepcidin causes internalization and degradation of iron-transporter ferroportin on duodenal enterocytes and macrophages, thereby blocking iron absorption and iron recycling, respectively. In hereditary hemochromatosis (HH), defective hepcidin synthesis results in a subsequent increase in body iron stores. In CHepC, hepatic iron overload has been attributed to the mutation of the hemochromatosis protein (HFE) gene, since several reports have found an association between HFE genotypes and iron overload in patients with CHepC [8]. Another possible mechanism is the direct effect of the hepatitis C virus (HCV) on hepcidin synthesis. Transgenic mice expressing HCV polyprotein have been shown to have decreased hepatic expression of hepcidin due to HCV-induced oxidative stress [9].

When hepatic iron overload develops, stainable iron can be seen either in hepatocytes (HC), reticuloendothelial cells (REC), or both cell types. Recently, patterns of hepatic iron distribution have attracted a considerable attention in chronic liver diseases, since the patterns would predict the histological progressions [10]. In particular, nonparenchymal iron deposition has been associated with advanced stages of alcoholic liver disease (ALD) and nonalcoholic steatohepatitis (NASH). The positive relationship was reported between histological activity and iron deposition either in REC or mixed HC/REC in patients with CHepC [11,12].

CONCLUSION:

It is concluded that elevated serum ferritin worsened liver injury. Hence it represents early marker for the severity of chronic liver disease, related both to the degree of liver fibrosis and to the inflammatory activity.

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