

Original Research

Evaluation of serum adiponectin levels in patients with chronic liver disease: An observational study

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ABSTRACT:

Background: The present study was conducted for evaluated serum adiponectin levels in patients with chronic liver disease. **Materials & methods:** A total of 100 patients with confirmed diagnosis of chronic liver disease were included in the present study. Complete demographic details of all the patients were obtained. A questionnaire was framed and detailed knowledge of radiographic investigations was recorded separately. Another set of age-and gender-matched 100 subjects which came for routine check-up were taken as healthy controls. Blood samples were obtained from all the patients and auto-analyser was used for evaluation of serum adiponectin levels. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. **Results:** Mean adiponectin levels among patients of CLD group and control group was 18.6 µg/mL and 8.5µg/mL respectively. While comparing the adiponectin levels among the patients of CLD group and control group, significant results were obtained. Also, while correlating Adiponectin levels with BMI, significant results were obtained. **Conclusion:** Serum adiponectin levels were significantly altered among CLD patients highlighting their role in the pathogenesis of the disease.

Key words: Adiponectin, Chronic liver disease

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INTRODUCTION

Cirrhosis is the final stage attained by various chronic liver diseases after years or decades of slow progression. There are, however, ways to prevent cirrhosis, because the diseases that most commonly lead to it progress slowly, and measures are available to prevent and treat them. Moreover, most cases of hepatocellular carcinoma (HCC) arise in a cirrhotic liver, so cirrhosis prevention is, in fact, also HCC prevention.^{1,2}

The clinical course of the disease is characterized by a “compensated” or asymptomatic phase followed by a rapidly progressive phase “decompensated”, resulting in development of complications (jaundice, variceal hemorrhage, ascites, encephalopathy) secondary to the two main syndromes associated with cirrhosis, ie, portal hypertension and hepatic insufficiency. Therefore, cirrhosis is classified into four stages, ie, two compensated stages (absence of ascites or presence of nonhemorrhagic esophageal varices) and

two decompensated stages (presence of ascites and variceal bleeding), which are related to hemodynamic changes in terms of portal pressure gradient and histological stages of fibrosis. Recently, a fifth stage has been proposed, that consists of infection (sepsis) in critically ill patients, and its presence has been associated with increased mortality.^{3- 5}Hence; the present study was conducted for evaluated serum adiponectin levels in patients with chronic liver disease.

MATERIALS & METHODS

The present study was conducted for evaluated serum adiponectin levels in patients with chronic liver disease. A total of 100 patients with confirmed diagnosis of chronic liver disease were included in the present study. Complete demographic details of all the patients were obtained. A questionnaire was framed and detailed knowledge of radiographic investigations was recorded separately. Another set of age-and

gender-matched 100 subjects which came for routine check-up were taken as healthy controls. Blood samples were obtained from all the patients and auto-analyser was used for evaluation of serum adiponectin levels. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Mann-Whitney U test and chi-square test were used for evaluation of level of significance.

RESULTS

Mean age of the subjects with CLD and healthy controls was 48.5 years and 45.9 years respectively. 76 percent of the subjects of CLD group and 70 percent of the subjects of the control group were males. Majority of the subjects of both the study groups belonged to urban residence. Mean adiponectin levels among patients of CLD group and control group was 18.6 µg/mL and 8.5µg/mL respectively. While comparing the adiponectin levels among the patients of CLD group and control group, significant results were obtained. Also, while correlating Adiponectin levels with BMI, significant results were obtained.

Table 1: Comparison of Adiponectin levels

Adiponectin levels (µg/mL)	CLD group	Control group
Mean	18.6	8.5
SD	5.3	1.7
p-value	0.001 (Significant)	

Table 2: Corelation of Adiponectin levels with variables

Adiponectin levels (µg/mL)	r-value	p-value
Age	0.42737	0.7458
Gender	0.92469	0.3362
BMI	-0.00125	0.0013 (Significant)

DISCUSSION

Chronic liver disease is the tenth leading cause of death in the United States with more than 25,000 deaths annually according to federal statistics. There are an estimated 4 million known cases of hepatitis C in the United States; some of these patients present with cirrhosis or will eventually become cirrhotic. Our current ability to treat hepatitis C and eradicate the infection has been disappointing. Other chronic liver diseases that have no treatments include α1-antitrypsin deficiency, cryptogenic hepatitis, and primary sclerosing cholangitis. Some liver diseases, such as primary biliary cirrhosis, have treatments that delay progression but do not halt the liver injury. Many of these diseases progress slowly from hepatitis to cirrhosis, often over 20 to 30 years.⁶⁻⁸

Ultrasound has a major role in the diagnosis and management of chronic liver diseases by providing diagnostic and prognostic information as well as

detecting complications such as HCC and portal hypertension. While conventional ultrasound is valuable in the assessment of liver parenchyma and detection of liver lesions, a range of other ultrasound techniques has been developed that increases its potential value. In advanced liver disease approaching the stage of cirrhosis, thrombocytopenia is seen, along with impaired hepatic biosynthesis (as shown by, e.g., low concentration of albumin and cholinesterase and an elevation of the international normalized ratio [INR]) and impairment of the detoxifying function of the liver (as shown by, e.g., elevated bilirubin concentration). The transaminase concentrations are generally in the normal range or only mildly elevated. There is no well-defined threshold value of any laboratory test that can be used to determine when screening for cirrhosis should be performed.⁹⁻¹¹Hence; the present study was conducted for evaluated serum adiponectin levels in patients with chronic liver disease.

Mean age of the subjects with CLD and healthy controls was 48.5 years and 45.9 years respectively. 76 percent of the subjects of CLD group and 70 percent of the subjects of the control group were males. Majority of the subjects of both the study groups belonged to urban residence. Mean adiponectin levels among patients of CLD group and control group was 18.6 µg/mL and 8.5µg/mL respectively. In a similar study conducted by Balmer ML et al, authors determined adiponectin concentrations in patients with different forms and stages of chronic liver diseases. Adiponectin concentrations correlated positively with serum bile acids, serum hyaluronic acid and elastography values. Adiponectin levels were decreased in patients with NAFLD. In conclusion, adiponectin levels correlate positively with surrogate markers of hepatic fibrosis and are significantly elevated in cases of cirrhosis.¹²Arvaniti VA et al, in another previous study, investigated the correlation between serum adiponectin levels and steatosis, necroinflammation and fibrosis in different types of NAFLD patients. Patients with biopsy proven NAFLD were divided into two groups: non alcoholic steatohepatitis (NASH): 25 patients and simple steatosis: 18 patients. No correlation was found between adiponectin levels and BMI, ALT, AST, gamma GT or HOMA-IR. Patients with established NASH have lower serum adiponectin levels than NAFLD patients with normal or abnormal liver enzymes.¹³

In the present study, while comparing the adiponectin levels among the patients of CLD group and control group, significant results were obtained. Also, while correlating Adiponectin levels with BMI, significant results were obtained. Determination of serum levels of adipokines non-alcoholic fatty liver disease (NAFLD) patients was done in another previous study conducted by Lemoine M et al. Fifty-seven patients with biopsy-proven non-alcoholic steatohepatitis (NASH), 17 with simple steatosis and 10 controls

without steatosis were investigated. Three independent parameters were associated with fibrosis: age, BMI and high IL-6 levels. The hepatic expression of adiponectin receptor 2 was significantly higher in patients with NASH compared with controls and was related with necroinflammatory injury.¹⁴ Serum adiponectin levels were investigated in patients with NAFLD in a previous study conducted by Aygun C et al. Serum adiponectin levels are significantly lower in NAFLD patients with elevated liver enzymes. Non-alcoholic steatohepatitis patients show lower levels of adiponectin with higher grades of inflammation.¹⁵

CONCLUSION

Serum adiponectin levels were significantly altered among CLD patients highlighting their role in the pathogenesis of the disease.

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