

Evaluation of Lipid Profile and Proteins level among Infected Patients with Hepatitis B and C Viruses

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Abstract

Examination of plasma lipid profile could be considered as a clinical index to reflect liver damage in the active phase of hepatitis. This study aims to assessment of serum of lipid profile and proteins in patients infected with HBV and HCV. In cross sectional study 80 subjects were enrolled in this study. 40 diagnosed with positive HBV or HCV and 40 healths apparently as control group, age ranging between 19-55 years. Lipid profile, TP and Alb were measured by using spectrophotometric methods of full automated Mindray analyzer. The results showed HBV and HCV is common in youngest with 62.5% versus adults 37.5%. Also found significant increase in mean concentration of TG and LDL-C infected patients with (*P*-value 0.004 and 0.000) respectively. The results of TC, HDL-C, TP and Alb showed insignificant differences with *P*-value (0.346, 0.121, 0.328) respectively. Study concludes that, patients infected with HBV and HCV have higher level of TG and LDL-C, may indicate fatty liver as the results of hepatocellular damage.

Keywords: Chronic hepatitis B & C, Lipid profile, Total protein and Albumin.

1. Introduction

Chronic hepatitis B is a spectrum of disease usually characterized by the presence of detectable hepatitis B and C surface antigen (HBs Ag) in the blood or serum for longer than six months and may be inactive and cause no significant health problems, but may progress to liver fibrosis, cirrhosis and hepatocellular carcinoma. The progression of liver disease is associated with HBV levels in the blood [1].

Chronic hepatitis C has been linked to the development of hepatocellular carcinoma (HCC) in many parts of the world. Of the more than 500 000 new cases of liver cancer that occur each year, 22% (>100 000) are attributable to HCV infection[2]. Prospective studies have shown that 80% of all cases of acute hepatitis C progress to chronic infection; 10-20% of these will develop complications of chronic liver disease, such as liver cirrhosis, within two to three decades of onset, and 1-5% will develop liver cancer, making HCV a health problem of global importance[3].

Lipids, which exist as free molecules, are an essential component of biological membranes and can be metabolic regulators that control cell function and homeostasis. The liver plays a vital role in lipid metabolism and is the principal site of lipoprotein formation and clearance. Thus, in severe liver disease, lipid metabolism is profoundly disturbed. Ramcharran[4] found associations between lipid serum profiles and both HCV level with liver disease severity and Malavazi[5] reported an association between viral infection and abnormal lipid metabolism in the liver.

Hepatitis C virus (HCV) infection is associated with the development of steatosis in the liver.[8] Chronic hepatitis C is often recognized at an early stage of the disease, and liver fibrosis is mild or absent in about 80% of the patients undergoing a liver Biopsy.[9] HCV circulating particles exhibit a heterogeneous density that might reflect binding of the virus to very low-density lipoprotein (VLDL) and low-density lipoprotein (LDL). Published evidence supports the hypothesis that lipoproteins could provide affinity enhancement for certain human serum components [6]. HCV infection is associated with clinically significant lower cholesterol levels (TC, LDL and HDL) when compared with those of normal subjects.[10] This study was done to assess lipid profile alteration of HCV and HBV patients.

2. Materials and Methods

2.1 Study area

This research will be recruited form Khartoum state.

2.2 Study Subjects

This cross sectional study 80 case divided in two groups, group one diagnosed with HCV (17), HBV(23) and group two (40) as control. The age ranging between 19 to 55 years. This study carried in Ebn Siena Hospital, Khartoum state from February to May 2015, in the subjects serological test were done and serum lipid profile, TP and Alb estimated.

2.3 Inclusion Criteria

A total of 40 patients with HBV & HCV and 40 healthy people as controls were included in this study will be classified in to two groups

1st group: suffering from HBV & HCV infection

2nd group: Apparently healthy as control

2.4 Exclusion Criteria

Patient who had other liver diseases as HCC and patient with chronic lipidemia, would be excluded from this study

2.5 Clinical investigation:

The following investigation will be done for all patients and controls in the study:-

1. Serological test using HBV& HCV antibody
2. Liver function: using T.P and Alb
3. Lipid profile measurements (TC, TG, HDL-C, LDL-C)

2.6 Laboratory analysis

Venous blood sample (5ml) were collected from each participant under septic conditions and then divided into two parts. one (3ml) was collected in plain container for serological test and serum lipid profile and second (2ml) was collected in heparin container for TP, ALB, HDL C (Polyanion precipitation methods)Triglycerides (TG) and total cholesterol were determined by the endpoint detection (GPO-PAP Method), TP (biuret method) ALB (Enzymatic methods by BCG reagent) by using automatic biochemical analyzer.

2.7 Statistical analysis

Statistical analysis was performed using statistical package for social science (SPSS) software , evaluation of patient's data was performed using the ANOVA TEST with P-value <0.05.

3. Results

Table 1: show the level of Lipid profile between patients and control

Measured units	Means \pm SD		p- value
	Patients N =(40)	Control N =(40)	
TC	128.6 \pm 49.74	138.6 \pm 44.04	0.346
HDL	21.17 \pm 11.46	27.60 \pm 7.36	0.121
LDL	75.19 \pm 39.48	61.49 \pm 38.62	0.004**
TG	229.9 \pm 233.5	179.0 \pm 228.9	0.000***
TP	7.14 \pm 0.76	7.14 \pm 0.31	0.954
Alb	3.92 \pm 0.55	4.14 \pm 0.44	0.060

*** Highly significant ** significant

Table 2: The (mean \pm SD, Sig.) of lipid profile, TP and Abl for patients according to age group (>37, \leq 37).

Measured units	Means \pm SD		p- value
	Patients age > 37	Patients age < 37	
TC	127.06 \pm 53.72	129.60 \pm 48.31	0.748
HDL	23.46 \pm 8.09	19.80 \pm 13.04	0.880
LDL	46.88 \pm 257.29	45.44 \pm 223.61	0.592
TG	234.40 \pm 0.71	227.24 \pm .80	0.592
TP	7.08 \pm 0.66	7.18 \pm .49	0.403
Alb	3.92 \pm 0.66	3.92 \pm 0.494	0.637

4. Discussion

The study provides a detailed according of the contribution of HBV and HCV infection to variation of serum lipid profile. The biochemical parameters (TC, TG, HDL-C, LDL-C, TP and Alb) were measured for patient (40) with chronic hepatitis B&C and (40) healthy people as control. When compared with the control group, LDL and TG (75.19 \pm 39.48 and 229.92 \pm 233.55) mg/dl respectively showed significant different, TP and Alb were measured by using spectrophotometric methods of full automated Mindray analyzer, P-value 0.000 and 0.004 respectively. The Mean \pm SD value of other lipid profile TC, HDL-C (128.65 \pm 49.74, 21.17 \pm 11.46) respectively, showed insignificant value (P-value 0.346, 0.121)

respectively. The Mean \pm SD value of TP and Alb were (7.14 \pm 0.76, 3.92 \pm 0.55) respectively, and were showed insignificant value (0.954, 0.060). The age value showed insignificant (P<0.127) value compare with control groups (table 1). This finding similar to Mustafa[7] which reported that the VLDL and total lipid values were found out significantly low (p<0.002). Although the total cholesterol amount in patients with CHC is lower than that of healthy controls, this difference was not meaningful statistically (P=0.194). In addition, it wasn't determined any meaningful difference in both groups. The Patients age > 37 were (15) 37.5%, patients age < 37 were (25) 62.5%. When compared patients' according to age group (> 37, \leq 37) I found that the Mean \pm SD value of lipid profile TC, HDL-C, LDL-C and, TG (127.06 \pm 53.72, 129.6000 \pm 48.31), (23.46 \pm 8.09, 19.8000 \pm 13.04), (46.88 \pm 257.29, 45.4480 \pm 223.61), (234.40 \pm .71, 227.2400 \pm .80) respectively and the Mean \pm SD value of TP and Alb (7.08 \pm .66, 7.1840 \pm .49), (3.92 \pm 0.666, 3.9280 \pm 0.494) were respectively. The lipid profile TC, HDL-C, LDL-C and, TG were showed insignificant in all (P<0.748, P<0.880, P<0.592, P<0.592) respectively, also the TP and Alb showed insignificant in all (P< 0.403, P< 0.637) respectively.

5. Conclusion

Patients with HBV and HCV have higher level of TG and LDL-C as consequently may lead to CVD among infected individuals. These results indicate that in Sudanese patients infected with HBV and HCV, may a cause of lipid metabolism disturbances, which associated with fatty liver as the results of hepatocellular damage.

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