

Changes in Serum Lipid Profile Among Patients Suffering From Chronic Liver Disease.

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Objective: to find changes in lipid metabolism among patients suffering from chronic liver disease.

Design: Hospital based observational study.

Setting: Medical Unit-II Sheikh Zayed Medical College, Rahim Yar Khan.

Duration: January to July 2007.

Patients and Methods: About 160 Patients admitted in Medical Unit-II with a diagnosis of chronic liver disease were included in the study. Fasting lipid profile was done in all cases. Micro Lab 300 chemistry analyzer performed lipid Profile by end point kit method.

Results and Observations: There were 102 (63.75%) male and 58 (36.25%) were female patients. Total cholesterol was markedly decreased in 24 (15%) patients. Low to normal range was present in 132 (82.5%) patients. Hypercholesterolemia was seen in 4 (2.5%) patients. Hyper triglyceridemia was seen in one patient. Serum triglyceride levels were low to normal in 101 (63.13%) patients. HDL-c was below normal in all cases. LDL was low in 141 (88.13%) patients, normal in 12 (7.50%) patients and high in 7 (4.38%) patients.

Conclusion: Dyslipidemia is a common finding in chronic liver disease. Lipid profile should be done in all cases with advanced liver disease.

Key words: Dyslipidemia, LDL-c, HDL-c, Cholesterol, Triglycerides.

Lipids are essential component of biological membranes, free molecules and metabolic regulators that control cellular function and homeostasis. ¹ 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. 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. The transport of triglycerides, cholesterol and fat soluble vitamins from the liver to peripheral tissue and transport of cholesterol from peripheral tissue to liver is by lipoproteins. Apolipoproteins activate enzymes important in lipoprotein metabolism and to mediate the binding of lipoproteins to cell surface receptors. 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. It is affected in a variety of ways. Dyslipidemia seen in chronic liver disease differs from that found in most of the other causes of secondary dyslipidemias because circulating lipoproteins are not only present in abnormal amount but they also frequently have abnormal composition, electrophoretic mobility and appearance. Pre beta and alpha bands can be absent on electrophoreses in all types of liver disease.²

Cholestatic liver disease has been most extensively studied. There is marked elevation of free cholesterol and phospholipids in obstructive liver disease. In acute hepatocellular disease such as alcoholic or viral hepatitis, there is a cholestatic phase and similar changes may be seen e.g. increased cholesterol and phospholipid levels.²

In chronic liver disease due to decreased biosynthetic capacity of liver unusually low levels of cholesterol and triglycerides are found.

The purpose of this study is to see the lipid metabolism derangement in patients suffering from chronic liver disease.

Patients and Methods

About 160 patients admitted in Medical Unit-II Sheikh Zayed Medical College Rahim Yar Khan from January to July, 2007 were included in the study. The patients included were suffering from chronic liver disease irrespective of their etiology of this illness. The patients belonged to class B and C of Child Pugh's Classification.

The patients suffering from concomitant illnesses like Diabetes Mellitus, Hypertension or thyroid problem were excluded. None of the patients were using alcohol or lipid lowering drugs.

After taking complete history and physical examination, fasting blood samples were sent for lipid profile. Results were compiled and analyzed.

Results

Total numbers of 160 patients were included in the study. Their age and sex distribution was as follows.

Table 1: Age and Sex Distribution. Total number of 160.

Age in Year	Male n=102	%	Female n=58	%
20-30	10	9.80	03	5.17
31-40	23	22.55	12	20.69
41-50	62	60.78	28	48.28
51-60	04	3.92	12	20.69
61 and above	03	2.94	03	5.17

Most of the cases belonged to middle age group.

Table 2: Lipid Profile, Total Cholesterol. Total number 160.

Total Cholesterol mg/dl	Male n=102	%	Female N=58	%
50-100	10	9.80	14	24.14
101-150	81	79.41	39	67.24
151-200	08	7.84	04	6.90
201-250	02	1.96	01	1.72
251 and above	01	0.98	00	0.00

Table 3: S. Triglycerides

Serum Triglycerides mg/dl	Male n=102	%	Female n=58	%
50-75	12	11.76	06	10.34
76-100	70	68.63	20	34.48
101-125	14	13.73	26	44.83
126-150	05	04.90	06	10.34
151 and above	01	00.98	00	00.00

Most of the patients 148(92.5%) show decreased serum triglyceride levels.

Very low cholesterol levels was seen in 24 patients, 10 were male (9.80%) and 14 were (24.14%) female patients. Low to normal levels were seen in 132 patients. Hypercho-

lesterolemia was seen in 4 patients i.e. 3 (2.94%) male and one female patient (1.72%).

It was concluded that total cholesterol, triglycerides, HDL and LDL levels were reduced in most of the cases.

Table 4: HDL-c Levels.

HDL-c mg/dl	Male n = 102	%	Female n = 58	%
20-30	01	0.98	03	5.17
31-40	89	87.25	50	86.21
41-50	12	11.76	05	8.62
51-60	00	0.00	00	0.00
61 and above	00	0.00	00	0.00

Table 5: LDL-c Levels.

LDL-c Levels mg/dl	Male n=102	%	Female n=58	%
50-75	10	9.80	21	36.21
76-100	13	12.75	07	12.07
101-125	62	60.78	28	48.28
126-150	11	10.78	01	1.72
151 and above	06	5.88	01	1.72

Some patients were having normal levels. A few patients showed hyperlipidemia. It shows that dyslipidemia is a common finding in cases suffering from chronic liver disease.

Discussion

Dyslipidemia is a frequent finding in chronic liver disease. Dyslipidemia is also seen in other illnesses like diabetes Mellitus and chronic renal failure etc. Many national studies are available regarding dyslipidemia in Diabetes Mellitus or chronic renal failure.³ To the best of our knowledge no study was done for dyslipidemia in chronic liver disease in Pakistan. Internationally this subject has been dealt in detail. Many studies are available in which not only the derangement of lipid metabolism is shown but also its relation with the etiology of the chronic liver disease is made clear.⁴

Fernandez and Rodriguez CM.⁵ documented in their study that Hepatitis C genotype 3 chronic liver diseases is associated with serum lipid changes and these changes are reversible with sustained viral response. This interference with lipid pathway is related to viral load.

Brier C et al⁶ studied lipoproteins, HDL-apolipoproteins and activities of hepatic lipase and lecithin cholesterol acyl transference in the plasma of patients with post alcoholic liver cirrhosis. Their results showed that in alcoholic

cirrhosis, total cholesterol, HDL, VLDL, HDL-cholesterol and HL were all decreased. Intermediate density lipoproteins were not detectable in cirrhosis. LDL from cirrhotic patients contained more triglycerides and less esterified and free cholesterol.

Dyslipidemia in different liver disease like chronic hepatitis, liver cirrhosis, hepato-cellular carcinoma and metastatic liver disease was studied by Ooik et al.⁷ They found out that different lipid abnormalities are present in different liver diseases e.g. in chronic hepatitis, liver cirrhosis and hepato-cellular carcinoma the triglyceride and cholesterol levels decreased while LDL-triglyceride fraction increased, metastatic liver cancer showed a lower HDL-fraction level but higher levels of other parameters than hepato-cellular carcinoma.

Jiang J, et al.⁸ concluded that plasma levels of triglycerides, cholesterol, free fatty acids, HDL, low density lipoproteins Lpa, Apo A, and Apo B, were decreased in cases of hepato-cellular carcinoma they suggested that this may be due to hepato-cellular impairment and this also suggests poor prognosis. Marked lipid abnormalities are found in patients suffering from Hepatitis C and HIV coinfection.⁹

In our study we found decreased levels of total cholesterol, triglycerides, LDL and HDL in chronic liver disease irrespective of its etiology. Hypolipidemia is also found in malabsorption, malnutrition, malignancy, hyperthyroidism and immunoglobulin disorders.¹⁰ That is why the patients suffering from other concomitant illnesses were not included in the study.

Hypolipidemia is more marked in cases suffering for hepatitis C virus especially genotype 3a and this abnormality is directly related to viral load and viral response.¹¹⁻¹³ As in our country the common type of HCV is genotype 3a. It is recommended that lipid profile should be done in all cases suffering from chronic liver disease especially when it is due to HCV genotype 3a.

Conclusion

Dyslipidemia is a common finding in chronic liver disease. It helps in diagnosis of severity of liver disease and also acts as a good prognostic sign. Lipid profile must be done in all cases with advanced liver disease.

References

1. Chiang JY, Nuclear receptor regulation of lipid metabolism: potential therapeutics for dyslipidemia, dia-

betes, and chronic heart and liver diseases. *Curr Opin Investing Drugs*. 2005; 6:994-1001.

2. Miller JP, Dyslipoproteinaemia of liver diseases. *Baillieres Clin Endocrinol Metab*. 1990; 4: 807-32.
3. Khalid Amin, Masood Javed, Muhammad Abid, et al: Pattern of dyslipidemia in patients with CRF. *Professional Med J* 2006; 13: 79-86.
4. Wisniewska-Ligier M, Wozniakowska-Gesicka T, Kups J, Sulat-Syncerek D. Lipid metabolism in children with chronic hepatitis C, A preliminary report. *Hepatogastroenterology*. 2006; 53:887-91.
5. Fernandez-Rodriguez CM, Lopez-Serrano P, Alonso S, Gutierrez ML, et al: Long-term reversal of hypocholesterolaemia in patients with chronic hepatitis C is related to sustained viral response and viral genotype. *Aliment Pharmacol Ther*. 2006; 24: 507-12.
6. Breier C, Lisch HJ, Braunsteiner H. Lipoproteins, HDL-apolipoproteins, activities of hepatic lipase and lecithin-cholesterol acyltransferase in the plasma of patients with post-alcoholic end-stage liver cirrhosis. *Klin Wochenschr*. 1983 15; 61:929-31.
7. Ooik, Shiraki K, Sakurai Y, Morishita Y, Nobori T. Clinical significance of abnormal lipoprotein patterns in liver diseases. *Int J Mol Med*. 2005; 15:655-60.
8. Jiang J, Nilsson-Ehle P, Xu N. Influence of liver cancer on lipid and lipoprotein metabolism. *Lipids health Dis*. 2006; 3; 5:4.
9. R Bedimo, R Ghurani, M Nsuani, D Turner, M-B Kvanli, G Brown and D Margolis. Lipid abnormalities in HIV/hepatitis C virus-coinfected patients. *HIV Medicine* 2006 7:8, 530-536.
10. Andrikoula M, Avades T. Hypolipidaemia is not always indicating liver dysfunction. A review of primary and secondary high density lipoprotein and low density lipoprotein deficiencies. *Minerva Med*. 2006 ; 97: 487-94.
11. Jarmay K, Karacsony G, Nagy A, Schaff Z. Changes in lipid metabolism in chronic hepatitis C. *World J Gastroenterol*. 2005; 7; 11: 6422-8.
12. Siagris D, Christofidou M, Theocharis GJ, Pagoni N, Papadimitriou C, et al: Serum lipid pattern in chronic hepatitis C: histological and virological correlations. *J Viral Hepat*. 2006; 13: 56-61.
13. Rubbia-Brandt L, Leandro G, Spahr L, Giostra E, Quadri R, Male PJ, Negro F, Liver steatosis in chronic hepatitis C: a morphological sign suggesting infection with HCV genotype 3. *Histopathology*. 2001; 39: 119-24.