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Case Report

# Asymptomatic severe dyslipidemia in a middle aged man: A Case report

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ABSTRACT

We describe case of nonobese, North Indian man involved in daily moderate to vigorous activity, who presented for routine biochemical profile. On centrifugation blood was found to be highly lipemic and lipid profile was grossly deranged. He had combined hyperlipidemia with predominant hypertriglyceridemia, highly raised apolipoprotein B and uric acid. The patient was further evaluated, started on combination therapy with statins and fibrates and followed weekly for next six weeks. Only a positive dietary history of high carbohydrate and fat intake could be elucidated. At baseline, total cholesterol was 789 mg/dl and serum triglycerides were 2400 mg/dl. His uric acid and apolipoprotein B levels were 11.1 mg/dl and 697 mg/dl respectively. The patient remained asymptomatic throughout the follow-up and showed a dramatic improvement in uric acid levels and lipid profile including Apolipoprotein B. In rare cases like the present one, massive hypertriglyceridemia may remain silent over many years without any clinical presentation.



## 1. Introduction

Lipid abnormalities are caused by the interactions of genetic and environmental factors. Hypertriglyceridemia may be primary (due to various genetic defects) or secondary in nature (acquired causes). Secondary hypertriglyceridemia may be caused by high fat diet, obesity, diabetes, hypothyroidism, and certain medications [1]. Hypertriglyceridemia is frequently associated with other lipid abnormalities and the metabolic syndrome (cluster of abdominal obesity, insulin resistance, low high-density lipoprotein (HDL), high triglyceride, and hypertension), which are linked to coronary artery disease [2]. It leads to complications like pancreatitis and cardio vascular disorders. Risk for pancreatitis is clinically significant with serum triglyceride >1000 mg/dL [3,4].

Triglycerides (TG) are synthesized in the intestine and liver and packaged as major components of very low-density lipoprotein (VLDL) and chylomicrons respectively. Any disturbance leading to decreased metabolic breakdown or increased synthesis of VLDL and/or chylomicrons can cause elevation in TG levels [1]. Elevation in TG levels may result from either increased dietary intake or genetic mutations affecting enzymes involved in the lipid metabolism.

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## 2.Case report

Here we describe a case of 56-year-old thin built male, driver by profession with part-time job on his farms, who came for a routine check up. He was absolutely asymptomatic, non-diabetic and non-hypertensive. He was non-smoker, social alcoholic (3-4 drinks/month), with body mass index of 22.8. He led an active physical life and could walk up to 5 miles a day without any chest discomfort. On the routine check, first time lipid profile revealed a markedly raised TG at 2400mg/dl with total cholesterol (T chol) 789 mg/dl. Serum Apolipoprotein B was grossly elevated, HDL cholesterol was undetectable, urea was 20 mg/dl, Creatinine was 0.9 mg/dl, uric acid was 11.1 mg/dl, total protein was 9.5 g/dl, and albumin was 3.6 g/dl. Blood glucose and glycated hemoglobin were normal at 92 mg/dl and 5.8%, respectively. Liver function test revealed a moderately raised serum SGOT (60 U/L) and normal SGPT levels (35 U/L) and normal serum Gamma Glutamyl Transferase (15 IU/L). Serum amylase was found to be normal at 105 U/L. The finding of severe hypertriglyceridemia prompted us to investigate him further for other components of the metabolic syndrome. Baseline liver function, thyroid status, serum amylase and inflammatory markers were analyzed. He was started on atorvastatin 40 mg and fibrate 200 mg twice daily and was then reviewed every week for next 6 weeks for all biochemical analytes. (Table1). By the end of 4 weeks the lipid profile including Apolipoprotein B levels were found to be normal.

Thyroid profile, CRP, ferritin and insulin were analyzed in second week. Serum ferritin and CRP were followed till last week (Table2). Serum ferritin was markedly raised with borderline high CRP. Serum Insulin and thyroid profile was normal.

He had no family history of ischemic heart disease, gout or any gastro intestinal disorder. Familial hyperlipidemia was ruled out as lipid profiles of his children and brother were found to be absolutely normal. He gave history of intake of high carbohydrate and high fat diet since childhood. No other abnormalities were noted on physical examination. His cardiovascular, respiratory and abdominal examinations were unremarkable. ECG was negative for ischemic changes. Chest radiograph did not reveal any abnormality. Exercise tolerance test/TMT was negative for any reversible ischemic changes. Ultrasound examination of abdomen revealed no abnormalities and fatty degeneration of liver was excluded. An important finding here was that the massive hypertriglyceridemia had not caused any complication unlike cases described in the literature.

**Table1. Weekly biochemical profile of the subject**

| | Initial profile | After Week1 | After Week2 | After Week3 | After Week4 | After Week5 | After Week6 |
|---|---|---|---|---|---|---|---|
| TC | 789 | 705 | 452 | 269 | 180 | 118 | 114 |
| TG | 2400 | 791 | 530 | 296 | 169 | 133 | 123 |
| HDL | undetected | 19/52 | 42 | 32 | 35 | 36 | 50 |
| LDL | 565 | 468 | 304 | 157 | 101 | 56 | |
| ApoB | 697 | 522 | 380 | 206 | 151 | 94 | |
| Glucose | 92 | 88 | 75 | 78 | 76 | 73 | 76 |
| Urea | 20 | 19 | 21 | 20 | 22 | 21 | 20 |
| Creat | 0.9 | 1.2 | 1.0 | 0.9 | 0.9 | 0.8 | 0.7 |
| Uric Acid | 11.1 | 6.1 | 5.8 | 5.0 | 3.9 | 4.0 | 4.5 |
| Bil | 1.2 | 0.8 | 0.9 | 0.8 | 0.8 | 0.7 | 0.6 |
| SGOT | 56 | 47 | 40 | 35 | 28 | 27 | 28 |
| SGPT | 35 | 33 | 30 | 30 | 25 | 13 | 12 |
| T Prot | 9.5 | 7.8 | 7.5 | 7.3 | 7.1 | 7.0 | 6.7 |
| Alb | 3.6 | 3.5 | 3.3 | 3.2 | 3.3 | 3.3 | 3.1 |
| Sodium | 123 | 128 | 130 | 131 | 135 | 133 | 137 |
| Potassium | 3.6 | 3.5 | 3.7 | 4.0 | 4.1 | 4.1 | 4.4 |
| Amylase | 105 | 95 | 67 | 71 | 59 | 60 | 61 |
| GGT | 15 | - | 15 | - | 14 | - | 14 |

**Table 2. Hormonal and inflammatory profile**

| | At Week 2 | At Week 4 | At Week 6 |
|---|---|---|---|
| FT3 (pg/ml) | 2.95 | 2.67 | 2.71 |
| FT4 (ng/dl) | 0.93 | 1.0 | 1.1 |
| TSH (μIU/ml) | 2.16 | 2.24 | 2.2 |
| Insulin (μIU/ml) | 2.9 | 3.2 | 4.1 |
| CRP (mg/dl) | 1.2 | 0.9 | 0.5 |
| Ferritin (ng/ml | 1785 | 1676 | 1206 |

## 3.Discussion

According to the National Cholesterol Education Program Adult Treatment Panel (NCEP ATP III) guidelines, a normal triglyceride level is <150 mg/dl [3]. The elevated triglyceride levels are generally due to an increase in VLDL (very low density lipoprotein), that can result from genetic predisposition or can be exacerbated by secondary factors [5]. High triglyceride levels are often associated with elevated cholesterol levels [mixed hyperlipidemia], which are known to play a major role in the development of endothelial dysfunction and subsequently in the accelerated formation of atherosclerotic plaques. A number of mechanisms like retention of chylomicron and VLDL remnants, small dense LDL, low HDL and increased coagulability of the plasma link raised TG with cardiovascular disorders [6-8].

The initial impression was that our patient was a case of familial combined hyperlipidemia but the absence of family history and normal lipid profiles in offprings and siblings excluded the possibility of familial combined hyperlipidemia. Despite the fact that he did not have any evidence of ischemic changes on ECG and TMT, presence and development of any occult coronary atherosclerosis could not be excluded. Another unusual finding was very high levels of serum ferritin. Reviewing the literature, we were able to find one similar case of a man with asymptomatic massive hypertriglyceridemia(9) and two case reports of severe hypertriglyceridemia presenting with acute chest pain in the absence of evidence of Ischemic heart disease, one patient was known to have Type II Diabetes Mellitus and the other patient was a pregnant lady [10,11].

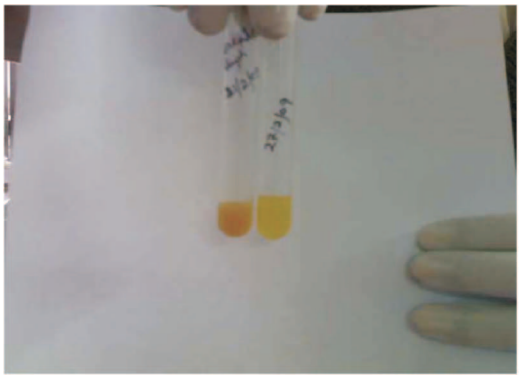
No direct relationship between hypertriglyceridemia and high uric acid levels has been reported till date. The common factor that links them is a diet enriched in fructose. Fructose has been shown to increase endogenous production of uric acid along with de novo lipid synthesis, thereby resulting in increased output of triglyceride-rich lipoproteins from liver [12,13]. It has been suggested that high uric acid levels may increase the likelihood of hypertriglyceridemia and/or low HDL levels,

visceral obesity, insulin resistance, hypertension, all of which represent features of the metabolic syndrome [14,15].

Based on his initial lipid profile, the patient was considered as a high-risk case of future IHD and pancreatitis. The patient was advised medications, which included statins and fibrates along with lifestyle modifications including alcohol. Moreover, he was advised about the diet modification since that was the only traceable culprit in his case. Fibrates work by lowering hepatic apolipoprotein C-III production and increasing lipoprotein lipase that results in decreased VLDL production [16]. His initial uric acid levels were very high which started declining when he started fenofibrates and atorvastatin. Earlier literature has also shown a decline in uric acid levels with fenofibrates and atorvastatin [17].

Our patient had very high serum ferritin levels. Serum ferritin values have been reported to be significantly increased in men and women with high BMI, increased cholesterol and in hypertensives [18]. Chronic alcohol consumption increases serum markers of iron stores, even when alcohol intake is not in the range known to be harmful [19]. Studies have shown that statin treatment leads to significant decrease in ferritin levels in body along with decreased cholesterol in diabetics [20]. Our patient, though not a diabetic showed a significant fall in serum ferritin levels over 4 weeks after commencement of statin and fibrate therapy.

**Figure 1: Visual differences in serum of the patient at first visit and after 1 week**



The patient's TG and hence the lipemia improved over a period of five days (as seen in figure 1); nonetheless, there was reversed increase in the ratio of T chol to TG. This case report describes a man with severe hypertriglyceridemia which was a chance finding as he had no physical illness or clinical manifestation of hyperlipidemia. The patient was completely asymptomatic despite severe dyslipidemia and this asymptomatic presentation could be ascribed to his daily moderate to vigorous physical activity. His triglyceride levels improved following lifestyle modification and combinations of anti-hyperlipidemic drugs, which illustrates the importance of lipid lowering agents on clearing fat deposit from the body. Despite the fact that more than two lipid-lowering agents can cause liver dysfunction, combination of statin and fibrate was used which was well tolerated by the patient. There was a paradoxical improvement in his liver enzymes, SGOT being normalized within the reference range over a period of four weeks. Therefore, the pathogenesis and natural history of this metabolic condition needs to be understood in greater detail. This will help in identification of the subset of patients who have atypical metabolic presentation, but still could benefit from medical therapy.

## 4.Conclusion

In this patient, massive hypertriglyceridemia had been silent for many years, with no evidence of coronary heart disease, pancreatitis and liver fatty degeneration, typical complications present in such patients with low HDL. The patient has been under continuous follow up since the time of discovery of his unusual biochemical profile. The atypical metabolic presentation makes his profile a rare case as his physical condition is unaffected by the blood picture.

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