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Hypertriglyceridemia: a case report from diagnostic laboratory, Barasat, West Bengal, India

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ABSTRACT

Hypertriglyceridemia is defined as an abnormal concentration of triglyceride in the blood and has been associated with atherosclerosis, even in the absence of hypercholesterolemia. This case report is of 40-year-old man diagnosed to have hypertriglyceridemia who attended for routine screening in our diagnostic laboratory at Barasat. He was nonsmoker, non-alcoholic, had a reasonable diet with abundant fruits and vegetables, and was on regular exercise. He was not taking any lipid lowering medications. He hailed from Barasat, and was employed in Government sector in Barasat and policeman by profession. His father died at the age of 57 years in a heart attack; but his mother is healthy and now almost 62 years of age, and he has two brothers one elder and another younger to him, both are healthy. His blood pressure was normal, his body-mass index was 27, and his waist circumference was 96 cm and hip circumference was 103. His waist/hip ratio was 0.932. The Biochemical analyses were as follows– Fasting Glucose: 186 mg/dL, Total Cholesterol: 90 mg/dL, Triglycerides: 372 mg/dL, High-density cholesterol: 3.80 mg/dL, Low-density cholesterol: 2.90 mg/dL, VLDL: 83.20 mg/dL, Cholesterol/HDL-C ratio: 23.6:1, LDL-C/HDL-C: 0.07:1. This study revealed the increased prevalence of dyslipidemia to be more prevalent in 31–40 year males, suggesting that this group is at an increased risk of developing CAD leading to young infarcts. Combination lifestyle therapies *i.e.*, enhanced physical activity and dietary modification and therapeutic intervention would help us in the treatment and management of dyslipidemia.

1. Introduction

Hypertriglyceridemia is defined as an abnormal concentration of triglyceride in the blood and has been associated with atherosclerosis, even in the absence of hypercholesterolemia^[1]. It can also lead to pancreatitis in excessive concentrations^[2]. According to National Commission on Macroeconomics and Health (NCMH), a government of India undertaking, there would be around 62 million patients with CAD by 2015 in India and of these, 23 million would be patients younger than 40 years of age^[3]. As per the National Cholesterol Education Program Adult Treatment Panel (NCEP ATP III) guidelines, a normal triglyceride level is 150 mg/dL^[4]. In India, the prevalence of hypertriglyceridemia defined as a triglyceride level >150 mg/dL is 3.4%^[5]. Hypertriglyceridemia could be of primary or secondary in nature. The primary hypertriglyceridemia arises from various genetic defects leading to disordered triglyceride metabolism. Secondary causes are acquired ones, could be due to high dietary fat, obesity, diabetes, hypothyroidism, and certain medications. Hypertriglyceridemia is a risk factor for pancreatitis and it

accounts for 1% to 4% of cases of acute pancreatitis. Although a few patients can develop pancreatitis with triglyceride levels 500 mg/dL, the risk for pancreatitis does not become clinically significant until levels are 1 000 mg/dL^[6]. More importantly, however, hypertriglyceridemia is typically not an isolated abnormality. It is frequently associated with other lipid abnormalities and the metabolic syndrome (abdominal obesity, insulin resistance, low high-density lipoprotein (HDL), high triglyceride, and hypertension), which are linked to coronary artery disease. Considering the current status of cardiovascular diseases among Indians, a drastic rise in the incidence of the metabolic syndrome is foreseen. Thus, primary care physicians would come across hypertriglyceridemia more frequently and should be familiar with the evaluation and management of this common disorder.

2. Case report

A 40-year-old healthy man, who came for a routine screening in our diagnostic laboratory at Barasat dated 19.11.2010, was diagnosed having hypertriglyceridemia. On interrogation, he was found to be a nonsmoker, non-alcoholic, reasonable diet with abundant fruits and vegetables, and exercises regularly. He has not been taking any lipid lowering medications. He works in a government sector in Barasat and policeman by profession. His father

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died at the age of 57 years in a heart attack; but his mother is healthy and now almost 62 years of age, and he has two brothers one elder and another younger to him, both are healthy. His blood pressure was normal, his body-mass index was 27, and his waist circumference was 96 cm and hip circumference was 103. His waist/hip ratio was 0.932.

For lipid profile analysis twelve hours fasting blood samples were collected from the subject in our laboratory at Barasat. Five mL of blood samples was collected in a sterile test tube, allowed to clot and then carefully centrifuged at 3000 r.p.m for 10 minutes. Clear serum was used for analysis of lipid profile. The total cholesterol, triglyceride and high-density lipoprotein were analyzed enzymatically using kit obtained from Randox Laboratories Limited, Crumlin, UK. Plasma LDL-cholesterol was determined from the values of total cholesterol and HDL-cholesterol using the following formula[7]:

$$\text{LDL-cholesterol} = \text{TC} - \frac{\text{TG}}{5} - \text{HDL-cholesterol} \text{ (mg/dL)}$$

On analysis the following results were obtained:

Fasting glucose: 186 mg/dL, total cholesterol: 90 mg/dL, Triglycerides: 372 mg/dL, High-density cholesterol: 3.80 mg/dL, Low-density cholesterol: 2.90 mg/dL, VLDL: 83.20 mg/dL, Cholesterol/HDL-C ratio: 23.6:1, LDL-C/HDL-C: 0.07:1.

The biochemical investigations were repeated after one week and the following results were obtained:

Fasting glucose: 179 mg/dL, total cholesterol: 83 mg/dL, Triglycerides: 364 mg/dL, High-density cholesterol: 3.70 mg/dL, Low-density cholesterol: 3.10 mg/dL, VLDL: 82.24 mg/dL, Cholesterol/HDL-C ratio: 22.43:1, LDL-C/HDL-C: 0.84:1.

3. Discussion

This study reveals hypertriglyceridemia with normal total cholesterol and very low LDL-C and HDL-C levels. Increased prevalence hypertriglyceridemia are more prominent in 31–40 years age group as observed earlier studies[8], conforms to the current report. Enas *et al* in their study on coronary artery disease in Indians (CAD) study reports the prevalence of diabetes to be three to six times higher among south Asian's than Europeans, Americans and other Asians[9] which is also observed in this patient, showing fasting glucose as 186 mg/dL predicting high blood glucose levels with hypertriglyceridemia. We Indians have relatively higher risk of predisposition to coronary artery disease even at relatively lower level of cholesterol[10]. Further hospital based study also observed lower levels (<200 mg/dL) of cholesterol in 75% of patients with myocardial infarction which is indicative of the fact that we have lower threshold for the total cholesterol levels compared to western population adding to further risk of CAD[11]. The overall prevalence of hypertriglyceridemia differs between the age groups and it is higher in men than in women[12]. The contributing factor for hypertriglyceridemia in our report might be due to genetic predisposition as the subject is on a well balanced diet devoid of rich carbohydrates. High triglycerides levels have been associated with increased levels of small dense LDL which are considered to be highly atherogenic[13] which is not observed in this current case report as the LDL cholesterol is within normal reference range as per NCEP-ATP-III. Increased prevalence of low HDL has been reported earlier by Enas *et al.* who found that only 4% of Asian Indian men and 5% Asian Indian women had optimal HDL levels[9] and the similar findings have been observed in this patient as his HDL-C is very low (3.8 mg/dL) even when the serum sample was repeated twice. Low HDL-C levels are stronger predictor of occurrence and reoccurrence of MI and stroke and are

also associated with premature and severe CAD[8]. Oxidative modification of LDL-C is a key process of atherosclerosis and elevated LDL-C has been recognized as primary risk factor for CAD[14] by NCEP-ATPIII but our report didn't observe any significant increase in LDL-C. So the current report suggests, hypertriglyceridemia could be presented in a patient with elevated blood glucose and not necessarily be accompanied by dyslipidaemia.

In conclusion, this study revealed the increased prevalence of dyslipidemia to be more prevalent in 31–40 year males, suggesting that this group is at increased risk of developing CAD leading to young infarcts. Combination lifestyle therapies *i.e.*, enhanced physical activity and dietary modification and therapeutic intervention would help us in treatment and management of dyslipidemia.

Conflict of interest statement

We declare that we have no conflict of interest.

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