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Rare Case Report of Hyperlipoproteinemia with Familial Hypothyroidism.

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ABSTRACT

Hypothyroidism and type 2 diabetes are both typically associated with the increased level of triglycerides. There have been only a few case reports of hyperlipoproteinemia associated with type 2 DM and Hypothyroidism. We report here a case of a 38-year old female patient who was diagnosed with type 2 Diabetes millitus and Hypothyroidism associated with hyperlipoproteinemia with markedly elevated triglycerides level [2350mg/dl]. We found microcytic hypochromic anaemia with anisocytosis with occasional target cells formation of RBCs in peripheral blood smear, elevated TSH, and low free T4 level and dyslipidemia. She has been on thyroxine and Oral hypoglycemic drugs. Her follow up thyroid parameters found to be elevated.

Keywords: Hyperlipoproteinemia, Hypothyroidism, Diabetes Mellitus.

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INTRODUCTION

Diabetes mellitus and Hypothyroidism are major endocrine disorders leading to hyperlipoproteinemia. In many cases of Hypothyroidism, the levels of both total cholesterol and triglycerides are increased. About half of the type 2 diabetes patients were associated with type IV Hyperlipoproteinemia, in which the very low density lipoprotein (VLDL) level was usually elevated. Various studies have shown that type 2 diabetes along with hypothyroidism is associated with type V hyperlipoproteinemia and the Incidence among Indian population is 0.02% [1-5].

We report a similar type of case admitted in our hospital for sudden hypoglycemic episode.

Case Report

A case of 38-yr old female patient who is a known case of type 2 diabetes mellitus for the past 5 years and hypothyroidism for the past 3 years, is admitted for hypoglycemia and treated for the same and she gave history of numbness over her limbs. We found microcytic hypochromic anaemia with anisocytosis with occasional target cells formation of RBCs in peripheral blood smear, elevated TSH, and low free T4 level and dyslipidemia (total cholesterol 772mg/dl, triglyceride 2350mg/dl, HDL 38mg/dl, LDL-264mg/dl and VLDL 470mg/dl). Her lipid profile which has been checked 3 months before showed elevated level with markedly increased triglyceride level [1252mg/dl] but she is not prescribed with cholesterol reducing substances. She has been on thyroxine and oral hypoglycemic drugs. Her follow up thyroid parameters were found to be elevated. Her body mass index (BMI) was 26.2 kg/m^2. Her mother is a known case of type 2 DM, hypothyroidism and dyslipidemia. Her daughter has hypothyroidism.

Subsequent laboratory findings were as follows:

Hemoglobin 10.2 g/dL,
RBC volume 31%,
WBC 4,900/µL,
Platelet 240,000/µL,
Fasting blood sugar-440mg/dl,
Total protein 10 g/L,
Albumin 4 g/L,
Total bilirubin 1.2 mg/dl,
ALP 41 IU/L,
AST 14 IU/L,
ALT 28 IU/L,
Urea 35mg/dl
Creatinine 1.2mg/dl.
Sodium 135.1 meq/l,
Potassium 3.5meq/l,
Chloride 100meq/l.

The urine analysis was otherwise normal except for the presence of glucose.

Lipid profiles were as follows:

Total cholesterol 772mg/dl,
Triglyceride 2350mg/dl,
HDL 38mg/dl,
LDL-264mg/dl
VLDL 470mg/dl ,

The thyroid function tests

Determined by a CLIA method (Chemiluminescence immunoassay)
TSH 8.59 mIU/ml (normal range; 0.05-5.05 mIU/ml),

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Free T4 1.22 ng/dL (normal range; 0.95-2.23 ng/dL),
Free T3 2.46 pg/mL (normal range; 1.60-3.80 pg/mL).
Glycosylated hemoglobin A1c was 10.4%.

On the second day after admission, a creamy and clouded layer was found in her fasting whole blood that had been placed in the refrigerator. Lipoprotein electrophoresis findings indicated that the patient had Type V Hyperlipoproteinemia.

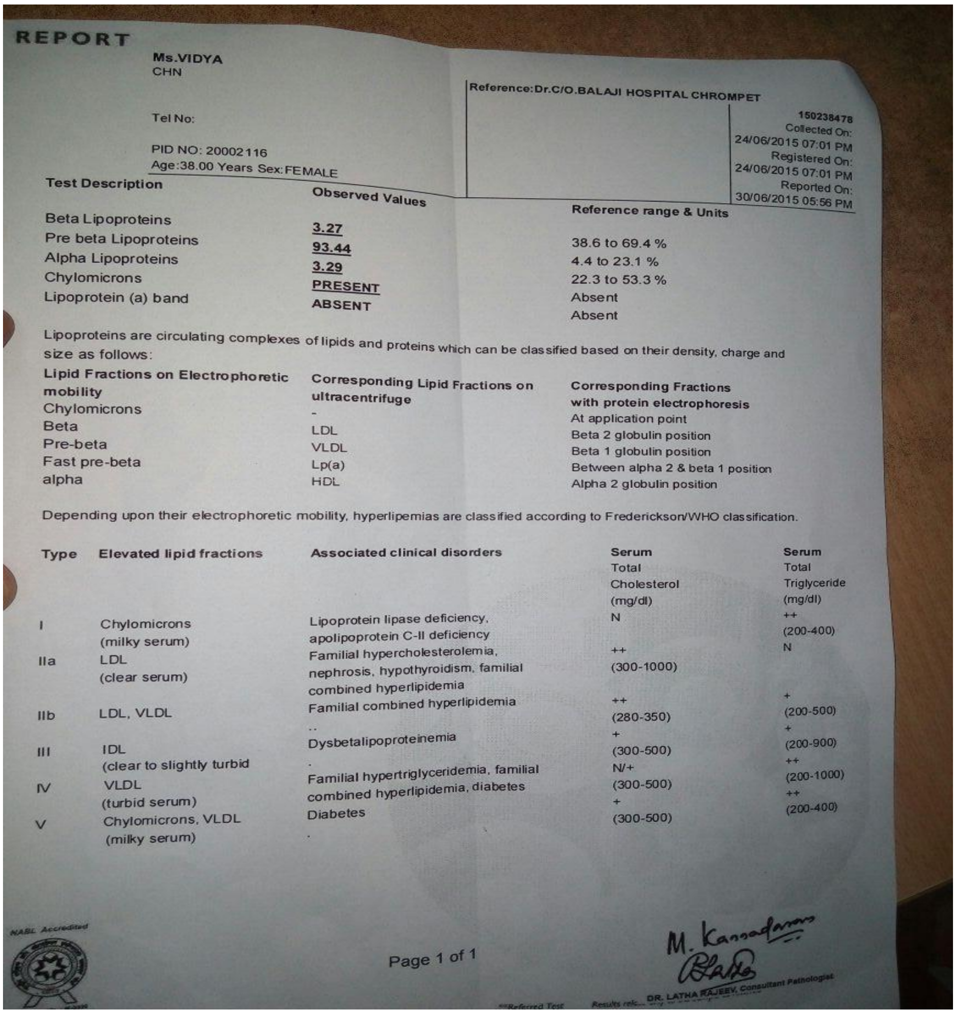
The findings of the electrophoresis report:

Beta lipoprotein 3.27%,
Pre beta lipoproteins 93.44%,
Alpha lipoproteins 3.29%,
Chylomicrons present,
Lipoprotein (a) band absent.

Laboratory findings at the time of previous admissions and at present

	TSH mIU/ML	FT4 ng/dl	HbA_1C %	FBS mg/dl	TC mg/dl	LDL mg/dl	TGL mg/dl
25TH APIRL	7.8	1.5	8%	325	420	198	1252
16TH J UNE	8.59	1.2	10.4%	440	772	264	2350

LIPOPROTEIN ELECTROPHORESIS REPORT



REPORT

Ms.VIDYA
CHN

Reference:Dr.C/O.BALAJI HOSPITAL CHROMPET

Tel No:

PID NO: 20002116
Age:38.00 Years Sex:FEMALE

150238478
Collected On: 24/06/2015 07:01 PM
Registered On: 24/06/2015 07:01 PM
Reported On: 30/06/2015 05:56 PM

Test Description	Observed Values	Reference range & Units
Beta Lipoproteins	3.27	38.6 to 69.4 %
Pre beta Lipoproteins	93.44	4.4 to 23.1 %
Alpha Lipoproteins	3.29	22.3 to 53.3 %
Chylomicrons	PRESENT	Absent
Lipoprotein (a) band	ABSENT	Absent

Lipoproteins are circulating complexes of lipids and proteins which can be classified based on their density, charge and size as follows:

Lipid Fractions on Electrophoretic mobility	Corresponding Lipid Fractions on ultracentrifuge	Corresponding Fractions with protein electrophoresis
Chylomicrons	-	At application point
Beta	LDL	Beta 2 globulin position
Pre-beta	VLDL	Beta 1 globulin position
Fast pre-beta	Lp(a)	Between alpha 2 & beta 1 position
alpha	HDL	Alpha 2 globulin position

Depending upon their electrophoretic mobility, hyperlipemias are classified according to Frederickson/WHO classification.

Type	Elevated lipid fractions	Associated clinical disorders	Serum Total Cholesterol (mg/dl)	Serum Total Triglyceride (mg/dl)
I	Chylomicrons (milky serum)	Lipoprotein lipase deficiency, apolipoprotein C-II deficiency	N	++ (200-400)
IIa	LDL (clear serum)	Familial hypercholesterolemia, nephrosis, hypothyroidism, familial combined hyperlipidemia	++ (300-1000)	N
IIb	LDL, VLDL	Familial combined hyperlipidemia	++ (280-350)	+ (200-500)
III	IDL (clear to slightly turbid	Dysbetalipoproteinemia	+ (300-500)	+ (200-900)
IV	VLDL (turbid serum)	Familial hypertriglyceridemia, familial combined hyperlipidemia, diabetes	N/+ (300-500)	++ (200-1000)
V	Chylomicrons, VLDL (milky serum)	Diabetes	+ (300-500)	++ (200-400)

NABL Accredited

Page 1 of 1

M. Kannadasan

DR. LATHA RAJEEV, Consultant Pathologist

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DISCUSSION

Most widely accepted classification for hyperlipoproteinemia is Frederickson's classification. The most common and highest incidence is type 2 A [familial primary hyperlipoprpteinemia] where LDL level will be raised. But in our case report electrophoresis revealed the presence of chylomicron and increased VLDL [1-4]. According to Frederickson's if the lipoprotein fraction chylomicron is elevated then it is type 1. Here both chylomicron and VLDL is elevated which confirmed the diagnosis of type 5 hyperlipoproteinemia. For most of the familial dyslipidemia patients, signs and symptoms will appear after 30 years of life. Hypothyroidism and type2 diabetes mellitus will worsen signs and symptoms of familial dyslipidemia. Various references have revealed that familial type 5 hyperlipoproteinemia is most common in patients who suffer from various metabolic diseases like type 2 DM and hypothyroidism. It is associated with glucose intolerance [5, 6].

It has been mentioned in many references that the possible causes includes mutation in gene responsible for lipoprotein lipase enzyme and apo C II. GPIHBP1 [glycosylphosphatidylinositol anchored high density lipoprotein binding protein 1 Gene] missense mutation variant, namely G56R appears to be associated with severe hypertriglyceridemia and chylomicronemia [6, 7].

CONCLUSION

As she has strong family history of Type 2 DM and Hpothyroidism,hyperlipoproteinemia associated in this case,the diagnosis is more likely to be Type 5Hyperlipoproteinemia of Frederickson's classification.

Though this dyslipidemia persists for life long, it can be controlled by regular follow up and treatment of metabolic diseases. Since there is a strong family history of type 2 DM and Hypothyroidism the genetic background should be evaluated further.

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