

Familial Chylomicronemia Syndrome Presenting With Acute Necrotizing Pancreatitis in a Five Month Infant

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Abstract

Familial chylomicronemia syndrome (FCS) is a rare disease characterized by severe fasting hypertriglyceridemia and chylomicronemia, which is inherited in an autosomal recessive manner. It is arisen from apolipoprotein C-II deficiency or Lipoprotein Lipase (LPL) Deficiency. We report a 5-month-old male infant FCS presenting with acute abdominal pain and post surgical diagnosis of acute necrotizing pancreatitis.

Key words: Pancreatitis, chylomicronemia, hyperlipidemia, lipoprotein lipase.

Introduction

Familial chylomicronemia syndrome is a genetic defect similar to familial hypercholesterolemia, which influences cleaning of lipoproteins containing apo-B. LPL deficiency or lack of LPL (or its cofactor, apo c-II), facilitates lypolysis and causes a striking rise of triglyceride level (found in serum) in the form of chylomicron, reducing HDL cholesterol level. Contrary to apo c-II deficiency or lack of apo c-II, chylomicron can be created in the case of LPL deficiency, leading to less increase in triglyceride of serum. Both defects are inherited in an autosomal recessive manner and their incidence is 1 out of 10,00,000¹. The disease usually appears in infancy with episodes of acute pancreatitis. Eruptive xanthoma may occur over the knees, arms and buttocks, and the patients may have hepatosplenomegaly². Here, we describe a 5 month-old male infant with FCS presenting with acute abdomen due to severe necrotizing pancreatitis.

Case Report

The patient, a 5-month-old male infant, was admitted in Imam Reza Hospital, Kermanshah, Iran, for fever and restlessness. He was the first child in the family, and was born by a normal vaginal delivery;

his parents were related (female cousin-male cousin). There was however no record of specific diseases in both the families. There was no history of use of any medicine, or allergies to any medicines or materials. The patient reported to have fever and restlessness since two days before transfer to our hospital. There was only one record of bilious vomiting that had occurred one day before his transfer.

Physical examination showed the patient was feverish and restless. His vital signs included Blood Pressure: 90mmHg (systolic), Respiratory Rate: 32 per minute, Pulse Rate: 124 per minute, Temperature: 37.8°C. Furthermore, his weight and length were 8 kg and 71 cm respectively and his head circumference was 46 cm. There was no apparent anomaly. Physical examination revealed abdominal tenderness and possibility of ascites.

He was restless, and there was mild tenderness in epigastric region. The liver and spleen sizes were in normal range for age. There were no fatty deposits under the skin, and examination of other organs was unremarkable; Fundoscopy was normal.

Table 1: Showing the Laboratory Investigation Results

WBC: 19,100/mm ³	Neutrophils: 65%	Lymphocytes: 33%	Eosinophils: 2%
MCV: 74.5fL	Platelets: 3,87,000/mm ³	Haematocrit: 31.9%	
Creatinine: 0.5mg%	Urea: 20 mg%	Ca: 8.1 mg%	PO ₄ : 7.0 mg%
Na: 139 meq/L	K: 5 meq/L	Bld Sugar: 80mg%	
PT/PTTK: Normal	Alk Phos: 341 IU/L	ALT: 10 IU/L	AST: 15 IU/L
Triglyceride: 975 mg%		Cholesterol: 189 mg%	
Lipase: 138 IU/L (5-60 IU/L)		Amylase: 17 IU/L (5-195 IU/L)	
Blood Culture: No Growth.		U/A & U/C: Negative.	

Table 2: Showing laboratory Results after re-admission

WBC: 11,500/mm ³	Neutrophils: 35%	Lymphocytes: 60%	Eosinophils: 5%
MCV: 75fL	Platelets: 2,72,000/mm ³	ESR:2	
ALT: 10 IU/L	Alk Phos: 341 IU/L	Ca: 8 mg%	PO ₄ : 6.9 mg%
AST: 12 IU/L	CPK: 107 IU/L	ABG: Normal	
Lipase: 103 IU/L (5-60 IU/L)		Amylase: 10 IU/L (5-195 IU/L)	
Triglyceride: 2348 mg%		Cholesterol: 479 mg%	

Abdominal x-ray revealed no significant finding except probability of a ureteral stone. Examination of ascites fluid showed Glucose: 253mg%, protein=6.3 mg/dl and culture was negative.

In the patient's initial abdominal ultra-sonogram, a considerable amount of ascites was reported. Considering the possibility of urinary stone in the right ureter and a suspicion of urinoma, an IVP was performed for the patient but it was reported as normal. The patient was referred for second abdominal ultra-sonogram that showed free liquid containing septa in abdominal cavity and pelvis. Since the intestinal peristalsis had reduced; peritonitis was suspected so a laparotomy was performed.

Surgical exploration showed abundant exudative effusions and fibrins, along with inflammation of the pancreas and there was edema also. According to the surgical findings a diagnosis of acute pancreatitis was made. All measures required for treating peritonitis was made, and after a week, he was discharged as a cured and normal patient.

Two weeks later, the patient was referred back, because he again had abdominal pain and restlessness. In the initial examination, the abdomen was soft but there was mild tenderness. The cardiovascular and respiratory systems were normal and he did not have fever. There were no specific deposits under the skin and other organs were normal on examination.

The blood sample, meanwhile, was completely milky (chylomicron). Considering the tests results

and the disease symptoms, familial chylomicronemia syndrome (Type I hyperlipidemia) was suspected. After giving Fresh Frozen Plasma (FFP) to the patient (which was prescribed for acute stage of his disease), symptoms and triglyceride levels reduced. The patient, meanwhile, was being treated with fat-restricted diet along with fat-soluble vitamins. Medium-chain fats were recommended to be consumed.

Discussion

(FCS) is a rare disease which is inherited in an autosomal recessive manner. It is characterized with severe fasting hypertriglyceridemia and chylomicron plasma, which arises from apolipoprotein C-II or LPL deficiency. In addition to familial hypertriglyceridemia, chylomicronemia also appears along with other diseases including diabetes mellitus, alcohol consumption, estrogen and glucocorticoid intake and uremia. Familial LPL deficiency is the most prevalent cause for molecule defect leading to FCS, with an incidence of 1/1000000¹.

It may usually appear in the early infancy or adolescence with recurrent courses of abdominal pain (with or without pancreatitis); the pancreatitis itself, if existed, starts with acute conditions. Main morbidity of the disease is with recurrent episodes of pancreatitis and will lead in some patients to pancreas deficiency or pancreas necrosis³. The first manifestation of the disease in our patient was acute necrotizing pancreatitis which was confirmed by diagnostic laparotomy. According to our knowledge, it is the first case that presented with acute necrotizing pancreatitis.

Hepatosplenomegaly and slight increase in hepatic transaminases are other findings of the syndrome, which arises from fat accumulation in these organs –a phenomenon which was not seen in our patient. Eruptive xanthoma may be caused due to chylomicron phagocytosis by skin macrophages, presenting as yellow deposits over the buttocks and extensor surfaces of the extremities⁴. Lipemia retinalis is another disease manifestation in which retinal vessels have lipaemic look and fundus is seen to be light pink. The deposit may be seen in plasma if the level of triglyceride is more than 4000mg/dl⁵. Among other manifestations; dementia, depression, and loss of memory can also be found. Although premature cardiovascular diseases have been identified in a number of the mentioned patients, it does not seem to be a background for premature atherosclerosis⁶.

Apolipoprotein C-II deficiency is a rare genetic defect, which is inherited in an autosomal recessive manner, being rarer than LPL deficiency. Although the clinical findings are similar to LPL deficiency, the symptoms appears later than LPL deficiency. Familial LPL deficiency can be diagnosed by increase in triglyceride level and plasma chylomicron, while Very Low Density Lipoprotein (VLDL) level is low normal. However, there is an increased level of VLDL in familial apo-cII deficiency along with other findings which may be observed in LPL deficiency. Apolipoprotein C-II level is usually assessed by gel electrophoresis. But it was not possible for our patient to evaluate LPL activity and to do an electrophoresis^{1,4,7}.

The patients with LPL and apo-cII deficiency can be treated with a fat-restricted diet being nearly 15% of the total calorie intake. Although fat restriction (10-15 grams daily) is suitable, saturated and non-saturated fat should be limited too, and need for calories should be compensated via medium-chain triglyceride. Furthermore, a greater degree of success was achieved via Omega-3 treatment also⁸. For the patients with apo-cII deficiency (not LPL deficiency) infusion of FFP can be used during an episode of acute pancreatitis. Considering this, we also tried to treat our patient whose disease was in the acute stage of pancreatitis. It led to improvement of the patient's symptoms; during convalescence, the patient was under treatment with omega-3 diet, fat restriction and fat-soluble vitamins.

In conclusion, FCS may be present as acute necrotizing pancreatitis and this rare syndrome should be considered in approaching the patients with acute pancreatitis. In these cases, serum lipids should be completely examined too.

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