Acute Relapsing Pancreatitis with Pseudocyst Formation due to Sporadic Hypertriglyceridemic Pancreatitis: A Case Report

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Abstract Acute pancreatitis is one of the common causes of the acute abdomen that should be included in any differential diagnosis for acute abdominal pain; it is also well known with its variant causes, of which most common is biliary tree stones, alcoholic pancreatitis, followed by a long list of other less common causes. We have reported a rare case of relapsing acute pancreatitis due to atypical sporadic hypertriglyceridemia (Frederickson's type IV) in a young male patient who was seen in the accident and emergency department presenting with severe agonizing abdominal pain, with history of recurrent similar attacks, which were unfortunately misdiagnosed elsewhere.

Keywords Pancreatitis · Acute abdomen · Pancreatic pseudocyst · Hypertriglyceridemia

Introduction

Hypertriglyceridemia is a common lipid abnormality in persons with visceral obesity, metabolic syndrome, and type 2 diabetes. Hypertriglyceridemia typically occurs in conjunction with low high-density lipoprotein (HDL) levels and atherogenic small dense low-density lipoprotein (LDL) particles and is associated with increased cardiovascular risk [1].

Acute pancreatitis is defined as typical pancreatic abdominal pain (mid epigastric with radiation to the back) persisting for several hours, associated with elevation of serum amylase or lipase (to more than three times the normal levels). Acute relapsing pancreatitis is defined as two or more well-documented separate episodes of pancreatitis (pain and abnormal laboratory studies) that resolve between attacks. Evidence of pancreatitis should be documented by computed tomography (CT) or magnetic resonance imaging (MRI) during at least one episode. Acute relapsing pancreatitis (ARP) represents a challenging problem in the field of hepatobiliary and pancreatic disorders. It is associated with significant morbidity, impairment in quality of life and a negative impact on medical costs [2]. Acute relapsing pancreatitis may result from alcohol ingestion, cholelithiasis, autoimmune disease, or congenital or acquired abnormalities of the ductal system. A minor fraction of patients may harbor a genetic defect predisposing them to acute relapsing pancreatitis [3].

Marked elevation of triglyceride levels appears to be causally linked to acute pancreatitis, and hyperlipidemia is found in 12–38 % of patients presenting with acute pancreatitis. Elevated cholesterol levels are not associated with pancreatitis [4].

Case Report

A 25-year-old average built male patient presented to the accident and emergency department with severe agonizing abdominal pain, nausea, and vomiting of 2 days' duration. Significant findings in his medical history were binge alcohol drinking, smoking of 5 cigarettes/day, similar attack 6 years earlier for which he was misdiagnosed elsewhere as intestinal obstruction, admitted in the ICU, and then

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explored with no available operative data. Four months later he was re-explored due to recurrent abdominal pain and segmental bowel resection plus temporary stoma.

On physical examination, the patient looked ill, dehydrated with no jaundice or cyanosis, screaming from agonizing abdominal pain. His vitals were as follows: pulse 110 bpm regular, BP 130/85 mmHg, temperature 37.5 °C, and RR 18/min.

Abdominal examination revealed several scars of previous laparotomies (Fig. 1), generalized tenderness, with maximal tenderness in the epigastric region, positive rebound tenderness, and infrequent bowel sounds.

Initial resuscitative measures were undertaken, and preliminary laboratory and radiology investigations were requested.

Laboratory results were as follows: random blood sugar 86 mg/dl, white blood cells (WBCs) 10.2 k/ml, Hb 12.4 g/dl, Plts 172 k/ml, PT 11.6, INR 1.01, amylase 2619 U/l, total bilirubin 1.5 mg/dl, direct bilirubin 0.3 mg/dl, ALT 41 IU/l, ALP 152 U/l, serum creatinine 1.5 mg/dl, LDH 881 IU/l, total calcium 8.8 mg/dl, albumin 3.7 g/dl, sodium 135 mmol/l, and potassium 5.3 mmol/l.

Abdominal X-ray was insignificant (Fig. 2). Abdominal ultrasonography revealed mildly dilated bowel loops and <20 ml free fluid collection.

A provisional diagnosis of acute pancreatitis was nominated; conservative measures were carried out including NPO, NG tube, fluid and electrolyte management, antibiotics, analgesics, anti-ulcer measures, and osteroids.

After 14 h fasting, due to the notion of the lactescent serum, a lipid profile was ordered as well as an abdominal CT with contrast to document the case of hyperlipidemic pancreatitis. Abdominal CT revealed bulky

Fig. 1 Multiple abdominal scars of previous operations

Fig. 2 Plain x-ray of the abdomen

edematous pancreas with blurred outline and fat striations as well as pseudocyst formation in the region of the uncinate process, denoting acute pancreatitis besides pleuropneumonic reaction (Fig. 3).

Serum triglycerides were markedly elevated—343 mg/dl (3.9 mmol/l), normal up to 150 mg/dl—with inversely low HDL but normal total cholesterol, LDL, and VLDL. At that time the final diagnosis of hypertriglyceridemic pancreatitis was obvious, so strict lipemic control for the patient as well as a fat-free diet regimen was given. Laboratory screening for his first-degree relatives—parents and two male siblings—was normal. Given the fact that a serum triglycerides of >1000 mg/dl is usually

Fig. 3 CT scan of the abdomen

Table 1 Frederickson's classification of lipid disorders [8]

Type	Average of		Associated clinical disorders	Serum	
	overnight serum	Elevated particles		TC	TG
I	Creamy top layer	Chylomicrons	Lipoprotein lipase deficiency, apolipoprotein C-II deficiency		
IIa	Clear	LDL	Familial hypercholesterolemia, polygenic hypercholesterolemia, nephrosis, hypothyroidism, familial combined hyperlipidemia		
IIb	Clear	LDL, VLDL	Familial combined hyperlipidemia		
III	Turbid	IDL	Dysbetalipoproteinemia		
IV	Turbid	VLDL	Familial hypertriglyceridemia, familial combined hyperlipidemia, sporadic hypertriglyceridemia, diabetes		
V	Creamy top, turbid bottom	Chylomicrons, VLDL	Diabetes		

IDL = intermediate-density lipoproteins; LDL = low-density lipoproteins; TC = total cholesterol; TG = triglycerides; VLDL = very low-density lipoproteins;

= increased; = greatly increased; = normal; = normal or increased.

needed to give rise to hypertriglyceridemic ARP, a diagnosis of sporadic—as opposed to familial (atypical)—hypertriglyceridemic (ICD-10: E 78–1) acute-relapsing pancreatitis was concluded. This coincided with Frederickson's type IV classification of hyperlipidemia, a rare cause of metabolic pancreatitis.

The patient was symptom free after 3 days of admission and was discharged 1 week later. Under strict medical

control he was followed in OPD with no recurrent attacks for 1 year.

Discussion

Acute pancreatitis secondary to hyperlipidemia is characterized by three presentations. All patients present with

abdominal pain, nausea, and vomiting of hours to days' duration. The most common presentation is a poorly controlled diabetic with a history of hypertriglyceridemia. The second presentation is the alcoholic found to have hypertriglyceridemia or lactescent serum on admission. The third, about 15–20 % of patients, is the nondiabetic, nonalcoholic, nonobese patient with drug- or diet-induced hypertriglyceridemia [5]. Hypertriglyceridemic acute pancreatitis is relapsing and its clinical course is more severe than lithiasic acute pancreatitis. The measurement of amylase and lipase levels is less useful in the diagnosis of hypertriglyceridemic than in lithiasic acute pancreatitis [6].

A serum triglyceride (TG) level of more than 1000–2000 mg/dl in patients with type I, IV, or V hyperlipidemia (Fredrickson's classification), see Table 1, is an identifiable risk factor. The typical clinical profile of hyperlipidemic pancreatitis (HLP) is a patient with a preexisting lipid abnormality along with the presence of a secondary factor (e.g., poorly controlled diabetes, alcohol use, or a medication) that can induce HTG. Less commonly, a patient with isolated hyperlipidemia (type V or I) without a precipitating factor presents with pancreatitis [7].

Interestingly, serum pancreatic enzymes may be normal or only minimally elevated, even in the presence of severe pancreatitis diagnosed by imaging studies [8].

Current management of hyperlipidemic acute pancreatitis includes lipid-lowering agents, diet control, and plasmapheresis if diagnosed in the first 24–48 h [9].

In our patient, clinical as well as laboratory data supported our initial working diagnosis of acute pancreatitis.

In the case of hypertriglyceridemic pancreatitis, elevated triglycerides (TG) hinder accurate calculation of the amylase and lipase levels. However, in this patient, this was not the case. Moreover, a lower serum level of TG was needed to trigger pancreatitis as in our patient this was elevated to only about 350 mg/dl (i.e., one third of the reported value in the literature). This patient also did not show any other predisposing factors such as diabetes mellitus or chronic alcoholism. The lower TG level may be explained by two reasons: the first being the fasting course of the patient who presented 2–3 days after the onset of his symptoms where triglyceride levels tend to fall, or it may signify the presence of a different phenotypic and genotypic variant involving the genetic expression of the pancreatic acinar cell membrane that renders it more vulnerable to lower levels of elevated triglycerides.

The genetic mechanism by which hypertriglyceridemia (HTG) leads to pancreatitis remains unclear. Several theories are postulated as mutational abnormalities in genes responsible for pancreatic ductal or acinar cell injury, including the cationic trypsinogen gene [protease, serine, 1 (trypsin 1) (PRSS1)], the pancreatic secretory trypsin inhibitor gene [serine peptidase inhibitor, Kazal type 1

(SPINK1)], the cystic fibrosis transmembrane conductance regulator gene [cystic fibrosis transmembrane conductance regulator (ATP-binding cassette subfamily C, member 7) (CFTR)], and inflammation genes such as tumor necrosis factor [tumor necrosis factor, TNF superfamily, member 2 (TNF)]—all are associated with hyperlipidemic pancreatitis (HLP) in patients with HTG [10].

Management of acute pancreatitis includes generous intravenous hydration, pain control, and no oral intake to ensure adequate bowel rest. These measures may be effective in controlling the triglyceride levels. However early initiation of oral feeding in these patients may exacerbate pancreatitis and also lead to worsening triglyceride levels. Total parenteral nutrition is an effective means of providing the necessary calories and essential amino acids while controlling the triglyceride concentrations and preventing the induction of pancreatitis [11].

Pancreatic pseudocyst treatment is controversial since 25–50 % of fluid collections after acute pancreatitis attack will be absorbed within 6–8 weeks spontaneously. Indications of nonresolution of the cyst are the size of more than 6 cm, multiple cysts, chronic pancreatitis, and progressive cyst enlargement [12].

Despite the rarity of the condition, hypertriglyceridemic acute-relapsing pancreatitis (HTG-ARP) is a recognized clinical condition that needs to be borne in mind and searched for. It should be differentiated from other causes of pancreatitis encountered by physicians. Most importantly this involves young practicing surgeons to prevent morbidity by unnecessary surgery and resulting mortality to this unfortunate group of patients.

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