AUCTORES
Globalize your Research

Clinical Research Notes

E.A. Akhtanin *

Open Access

Case Report

Co-existence of allergic rhinitis and asthma in children

Niloofar Rafiee [1], Masoumeh Hematyar [1], Seyed Karen Hashemitari [2], Sepideh Darougar [2]*

[1]Department of Pediatrics, Faculty of Medicine, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran.

[2]Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

***Corresponding Author:** Sepideh Darougar. Department of Pediatrics, Faculty of Medicine, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran.

Received date: November 24, 2024; **Accepted date:** December 02, 2024; **Published date:** December 10, 2024

Citation: E.A. Akhtanin, O.R. Arutyunov, P.V. Markov, (2024), Co-existence of allergic rhinitis and asthma in children , *J Clinical Research Notes*, 5(6); **DOI**:10.31579/2690-8816/151

Abstract

Background. Analysis of data from foreign and domestic literature shows that hypertriglyceridemic pancreatitis (HP) ranks 3rd in the general population of acute pancreatitis (AP), second only to alimentary and biliary pancreatitis and occurs in 10% of cases. HP is a common but little-studied disease. Incorrect diagnosis and erroneous tactics of surgical management, due to the rarity of HP, can lead to severe complications and death.

Clinical Case Description. A clinical case of a 36-year-old patient suffering from severe recurrent chronic pancreatitis for a long time, requiring hospitalizations up to 4-6 times a year for antipancreatic therapy, is presented. The main complaint of the patient was girdle pain in the upper abdomen that occurs after each meal, regardless of diet, and weight loss of 15 kg over the past 2 years. The diagnosis of GP was suspected on the basis of the main and additional methods of examination: medical history, clinical picture, ultrasound, MSCT and MRI of the abdominal organs, as well as indicators of clinical and biochemical blood tests. Radiological examination revealed biliary hypertension and a postnecrotic cyst of the pancreatic head. The final diagnosis was made after a genetic analysis of the blood of the patient and her parents. A family variant was revealed in the sequence of the LPL gene in a heterozygous variant inherited in an autosomal recessive manner. It was decided to refrain from surgical treatment in favor of specific treatment - diet, lipoprotein plasmapheresis 2 times a month, for life. Follow-up of the patient for 6 months. showed a pronounced positive trend: the normalization of blood counts, the absence of pancreatitis attacks and the positive dynamics of the x-ray picture.

Conclusion. Clinical observation shows that it is extremely important to identify hypertriglyceridemia as the cause of acute pancreatitis at an earlier stage. A high level of triglycerides aggravates the course of acute pancreatitis and increases the incidence of infected forms of pancreatitis. In connection with this, it is impossible to neglect both the main and additional methods of examining the patient. Incomplete examination or incorrect interpretation of examination results leads to incorrect tactics of surgical treatment and severe postoperative complications up to death.

Keywords: pancreatitis; pancreatic necrosis; hypertriglyceridemia

Introduction

Rationale. Gallstone disease and alcohol abuse are considered the two most common causes of acute pancreatitis (AP). At the same time, hypertriglyceridemia (HTG) is a rare risk factor for the development of AP with an incidence of approximately 2-4% [1]. Data from the National Cholesterol Education Program III (NCEP ATP III) indicate that triglyceride (TG) levels are classified as normal (<150), intermediate-high (150-199), high (200-499) and very high (pronounced) (> 500 mg/dL) (1 mmol = 88.5736 mg/dL) [2, 3]. The authors found that the level of triglycerides > 1000 mg/dl may be a risk factor for the development of AP. Epidemiological studies have shown different results. In the Linares CL study (2008), observations of 129 patients with HTG were analyzed, 26 (20.2%) patients were diagnosed with OP. Data from European population studies also show that the incidence of AP is 10–19% in patients with severe HTG (>1000 mg/dL) [4]. Sandhu et al. found that HTH cannot be the cause of AP at TG levels <1771 mg/dL because none of the 95 patients had AP at TG levels less than 1771 mg/dL. [5]. Researchers divide the etiology of HTG conditionally into 2 categories: primary and secondary. Primary hypertriglyceridemia differs in that it can cause more severe HTG, which is commonly seen in familial chylomicronemia syndrome (FCS) - Fredrickson type I, primary hypertriglyceridemia (Fredrickson type IV), and mixed hypertriglyceridemia (Fredrickson V). With the first type of HTG, chylomicronemia is noted - a change in the metabolism of chylomicrons. Lipoprotein lipase (LPL) deficiency is a rare autosomal recessive disease characterized by homozygous or heterozygous polymorphism of the LPL gene on the eighth chromosome [6]. Secondary HTG - acquired, develops as a result of diabetes

mellitus, renal failure, hypothyroidism, overweight, excessive alcohol consumption, drugs, pregnancy, etc. According to the literature, secondary hypertriglyceridemia is a risk factor for acute pancreatitis [7].

The exact mechanism of development of OP in the presence of HTG is still not clear and little studied. Generally accepted theories based on animal studies have identified 2 mechanisms of hypertriglyceridemic pancreatitis. The first mechanism is as follows: an increase in the level of triglycerides leads to the transport of the latter into chylomicrons (triglyceride-rich lipoprotein). They are hydrolyzed in the vessels of the pancreas to form free fatty acids (FFAs). FFAs increase the binding capacity of blood plasma albumin and are retained in micellar structures. Metabolites can have a damaging effect on platelet activity, the state of the vascular endothelium and acinar cells. This leads to the development of ischemic damage and acidosis, increased toxicity of FFA through trypsinogen activation and the formation of acute pancreatitis [8, 9]. According to the second mechanism, an increase in the content of chylomicrons, which are the largest among lipoproteins, is accompanied by an increase in blood plasma viscosity, blockage of capillaries, tissue ischemia, acidosis, and the development of OP as a result [10]. The clinical picture of GP is similar to OP of biliary and alimentary etiology, however, the severity of the course of the disease depends largely on the level of blood triglycerides.

Case Report

Patient P., 36 years old, was admitted on February 5, 2023. in the Department of Abdominal Surgery of the Federal State Budgetary Institution National Medical Research Center for Surgery named after N.N. A.V. Vishnevsky. At the time of hospitalization, she complained of girdle pain in the upper abdomen at every meal, weakness, nausea, occasional vomiting, darkening of urine when pain occurs. From the anamnesis it is known that the patient from 4 to 6 years old was observed at the Institute of Pediatrics of the Academy of Medical Sciences of the RSFSR in the gastroenterological department with a diagnosis of hyperlipoproteinemia I stage. After 6 years was not observed. He notes that he has been suffering from chronic pancreatitis for 5 years, when during pregnancy (8 months) against the background of general well-being, a clinical picture of severe pancreatic necrosis appeared. The patient was hospitalized in the surgical department at the place of residence for conservative therapy - without effect. The operation was performed - median laparotomy, urgent delivery, necrosequestrectomy, sanitation and drainage of the omental bag. In the early postoperative period, repeated sanitation of the abdominal cavity and omental sac was performed. The patient was discharged on the 30th day in a satisfactory condition. Hospitalizations in a surgical hospital at the place of residence for conservative treatment up to 5-6 times a year. With attacks of pancreatitis, he notes the clinical picture of obstructive jaundice (darkening of urine). In a biochemical blood test during hospitalization with an attack of pancreatitis, total bilirubin is up to 60 µmol/l, the direct fraction is up to 42 µmol/l. I applied to the Federal State Budgetary Institution "N.M. A.V. Vishnevsky" for consultation and determination of further management tactics.

Additional methods of examination

When examining according to CT of the abdominal organs with intravenous bolus contrast, a postnecrotic cyst of the pancreatic head with a diameter of about 4 cm is noted, infiltration of parapancreatic tissue in the area of the pancreatic head is noted, the body and tail of the pancreas are not traced (Fig. 1). MRI of the abdominal organs + MRCP (performed during an attack of pancreatitis) showed a postnecrotic cyst of the pancreatic head, biliary extrahepatic hypertension up to 12 mm with a block at the level of the pancreatic head (Fig. 2.). Taking into account the clinical data and X-ray examination methods (CT and MRI), the patient has chronic recurrent pancreatitis with a postnecrotic cyst of the pancreatic head, which requires endoscopic surgical treatment. At the first stage, it was decided to perform stenting of the terminal choledochus, taking into account biliary hypertension and clinical signs of obstructive jaundice during exacerbation of chronic pancreatitis (darkening of urine); The 2nd stage is the endoscopic formation of cystopancreatogastroanastomosis. Before the operation, the patient was recommended to perform Endoultrasound to determine the possibility of performing a surgical intervention and laboratory tests (clinical blood test, biochemical blood test, coagulogram, etc.) before hospitalization.

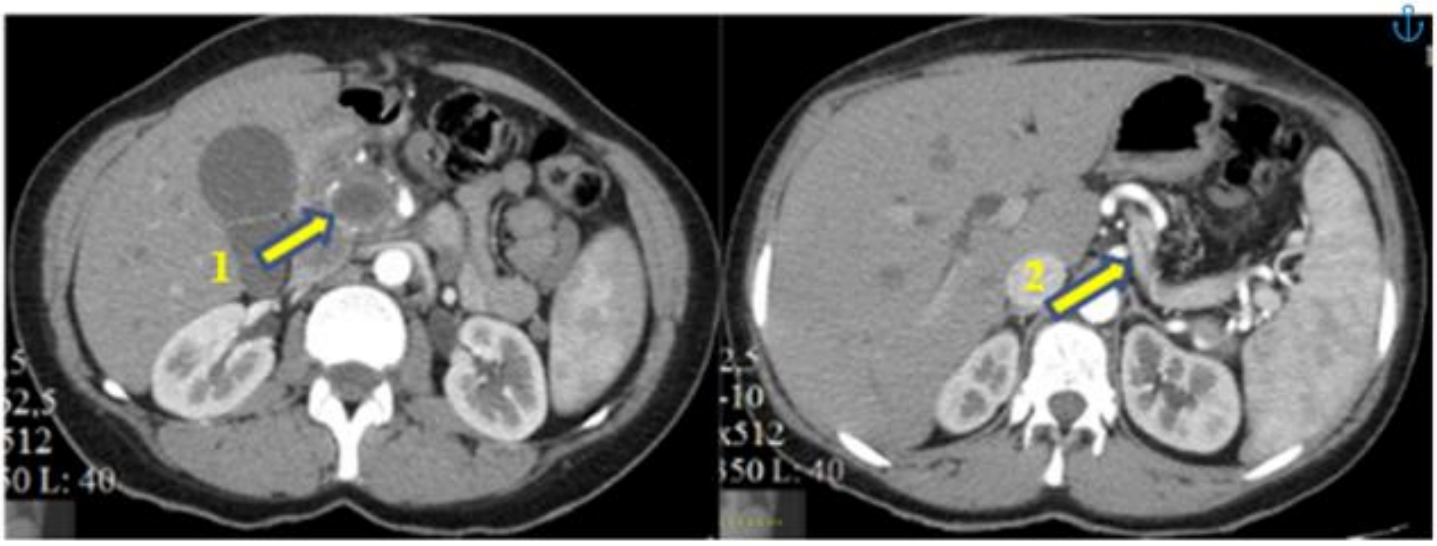

Figure 1: CT scan (arterial phase): 1 - postnecrotic cyst of the head of the pancreas (PG), about 4 cm in diameter; 2 - portal vein, tail and body of the pancreas are not visualized.

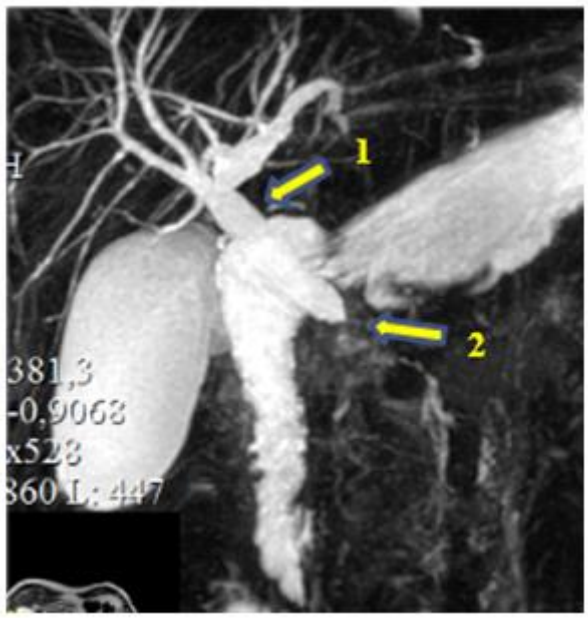

Figure. 2 MRCP image (during an exacerbation of chronic pancreatitis): 1 - biliary hypertension (common bile duct 13 mm); 2 - block at the level of the postnecrotic cyst of the head of the pancreas

Physical diagnosis

General condition at admission: moderate. BMI 20. The abdomen is not swollen, symmetrical, participates in the act of breathing. On palpation, there is moderate pain in the epigastric region. Postoperative scar without signs of inflammation, there is a hernial protrusion. The diameter of the hernial orifice is 4-5 cm. There are no cardiorespiratory disorders. Laboratory data (at the place of residence) - in the general blood test without features, in the biochemical blood test - total bilirubin 550 (norm 3.4 - 20.5) μmol / l., uric acid 418 (norm 150 - 350) μmol / l., total protein 196 (norm 64-83) g / l., triglycerides 34 (norm less than 1.70) mmol / l, creatinine 935 (norm 44 - 97) μmol / l. Comment: strong chillosis. The results of laboratory tests did not match the clinical condition of the patient. The patient was hospitalized for further examination. During hospitalization and repeated laboratory tests (A.V. Vishnevsky National Medical Research Center for Surgery), the results are similar. The patient is suspected of hyperlipoproteinemia. It was decided to refrain from surgical treatment.

Provisional diagnosis:

Primary: Chronic pancreatitis. Postnecrotic cyst of the head of the pancreas. Hyperliporoteinemia.

Related: Postoperative ventral hernia. Condition after necrosequestrectomy, urgent delivery, sanitation and drainage of the abdominal cavity in 2019. Taking into account the data of the additional examination, the patient was discharged with the recommendation of a consultation at the Federal State Budgetary Institution National Medical Research Center for Cardiology of the Ministry of Health of the Russian Federation in the Department of Lipid Metabolism Disorders. Upon consultation with a specialist in the department of lipid metabolism disorders, the diagnosis was made: Lipoproteinemia. Chronic pancreatitis. Postnecrotic cyst of the head of the pancreas Recommended: performing a genetic analysis for a mutation of the lipoprotein gene in the next of kin and performing a systemic lipid apheresis 2 times a month, lasting at least 1 year.

Dynamics and outcomes

During dynamic observation after 2 months, in order to correct lipid metabolism and microcirculatory disorders, 4 lipid filtration procedures were performed using the Spectra Optia apparatus (plasma fractionator Evaflux 5A20, volume of treated plasma 1.5 bcc) the patient's condition with pronounced positive dynamics: clinical symptoms acute pancreatitis completely regressed. The genetic study was carried out by mass parallel sequencing on the Illumina MiSeq device on the DNA material of blood cells. The patient underwent analysis of the coding sequence of 60 nuclear genes associated with the development of dyslipidemia. The sequencing data were processed by an automated program that included alignment of reads to the reference sequence of the human genome (hg19). The list of studied genes is given below. The integral evaluation of the panel coverage is 95%.

Conclusion of the genetic study of the patient: In exon 1 of the LPL gene, a variant was detected: with a frameshift NM_000237.3:c.64delC in the heterozygous state (dot coverage depth x405), (p.Arg22AlafsTer22). This variant is not described in the HGMD International Mutation Database. The identified variant of the nucleotide sequence was not registered in the control samples of gnomAD (The Genome Aggregation Database, v.2.1.1). According to ACMG criteria, this variant of the nucleotide sequence is pathogenic. In exon 3 of the LPL gene, a variant was identified: nucleotide substitution NM_000237.3:c.337T>C in the heterozygous state (dot coverage depth x100), p.(Trp113Arg). Described as pathogenic in databases of clinically significant variants (HGMD_ CM920476, ClinVar Variation ID:1540). The population frequency of the alternative allele (MAF) according to the gnomAD database (The Genome Aggregation Database, v.2.1.1) is 0.000004. Pathogenic variants in the lipoprotein lipase (LPL) gene lead to the development of autosomal recessively inherited hypertriglyceridemia, (OMIM ID_144250_238600).

Conclusion of the father's genetic study: Purpose: search for a family variant in the LPL gene sequence (NM_000237.3:c.64delC, p.(Arg22fs)). On the material of DNA of blood cells by direct automatic sequencing. This variant was found in the heterozygous state.

Conclusion of the genetic study of the mother: Purpose: search for a family variant in the LPL gene sequence (NM_000237.3:c.64delC,

p.(Arg22fs)). On the material of DNA of blood cells by direct automatic sequencing. This variant has not been identified.

Prognosis

The patient's prognosis for life, health and social adaptation, taking into account age, is favorable. However, it is strictly necessary to comply with the diet and conduct lipoprotein electrophoresis 2 times a month. Dynamic observation and assessment of the state of life and health will be assessed during monthly observation by a surgeon and a lipid metabolism specialist: The scope of the examination includes: clinical and biochemical blood tests, ultrasound and CT of the abdominal organs.

Discussion

Preoperative diagnosis of hypertriglyceridemic pancreatitis is not difficult and includes such imaging methods as ultrasound, MRI and MSCT of the abdominal organs with IV bolus contrast. The diagnosis is made on the basis of high levels of triglycerides and blood lipoproteins, which at the initial stage makes it possible to suspect the hypertriglyceridemic nature of acute pancreatitis [11]. Ultrasound and radiation diagnostic methods are the most informative method that allows you to accurately determine the complications of HP, the presence of postnecrotic cysts, ascites, the size of the pancreas, the degree of involvement of parapancreatic fat, etc. Differential diagnosis is carried out with alimentary, biliary pancreatitis, pancreatic cancer. Timely surgical treatment is necessary only in the complicated course of GP, and the amount of surgical intervention can vary significantly [12]. The first identified HP requires genetic diagnosis of the blood of the patient and her immediate family for mutations in the genes of lipoproteins.

Conclusion

Thus, clinical observation shows that the cause of the development of severe acute recurrent pancreatitis and its infected forms can be not only alimentary and biliary factors, but also high levels of lipoproteins and triglycerides, which has a damaging effect on the pancreas. In this clinical example, we are talking about primary HTG. It is important to keep this in mind, otherwise the wrong diagnosis leads to the wrong tactics of surgical treatment. Performing laparoscopy, sanitation laparotomies, endoscopic and ultrasound drainage of postnecrotic cysts in hypertriglyceridemic pankeratitis is only a symptomatic treatment and, as a rule, only temporarily improves the patient's condition.

Informed Consent

Informed consent. A voluntary written informed consent was obtained from the patient (legal representative) for the publication of his images in a medical journal, including its electronic version (date of signing 07/15/2023).

Additional Information

Author contribution. E.A. Akhtanin, O.R. Arutynov, — treatment of patients; processing and discussion of the results of the study, writing the text of the article; search and analytical work; P.V. Markov — management of patient treatment and discussion of the results of the study. The authors made a substantial contribution to the conception of the work, acquisition, analysis, interpretation of data for the work, drafting and revising the work, final approval of the version to be published and agree to be accountable for all aspects of the work.

Funding source. The study had no sponsorship.

Competing interests. The authors declare that they have no competing interests.

References

1. Valdivielso P., Ramirez-Bueno A., Ewald N. (2014), Current knowledge of hypertriglyceridemic pancreatitis. *European Journal of Internal Medicine*.25(8):689–694.
2. Yao F, Bo Y, Zhao L, Li Y, Ju L. (2021), Prevalence and Influencing Factors of Metabolic Syndrome among Adults in China from 2015 to 2017. *Nutrients*. 15;13(12):4475.
3. Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Executive Summary of The Third Report of The National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, And Treatment of High Blood Cholesterol In Adults (Adult Treatment Panel III). JAMA. 2001 May 16;285(19):2486-97.
4. Lloret Linares C., Pelletier A. L., Czernichow S. (2008), Acute pancreatitis in a cohort of 129 patients referred for severe hypertriglyceridemia. *Pancreas*. Vol. 37. P. 13–22.
5. Murphy M. J., Sheng X., Macdonald T. M., Wei L. (2013), Hypertriglyceridemia and acute pancreatitis. *JAMA Internal Medicine*. 173(2):162–164.
6. Gaudet D, de Wal J., Tremblay K. (2010), Review of the clinical development of alipogene tiparvovec gene therapy for lipoprotein lipase deficiency. *Atheroscler Suppl*. Vol. 11. P. 55–60.
7. Zheng Y., Zhou Z., Li H. (2015), A multicenter study on etiology of acute pancreatitis in Beijing during 5 years. *Pancreas*. Vol. 44. P. 409–414.
8. Ewald N., Hardt P. D ., Kloer H . U. (2009), Severe hypertriglyceridemia and pancreatitis. Presentation and management. *Curr. Opin. Lipidol*. Vol. 20. P. 497–504.
9. Gaudet D., Methot J., Dery S. (2013), Efficacy and longterm safety of alipogene tiparvovec (AAV1-LPLS447X) gene therapy for lipoprotein lipase deficiency. *An open label trial. Gene Ther*. Vol. 20. P. 361–369.
10. Scherer J., Singh V. P., Pitchumoni C. S., Yadav D. (2014), Issues in hypertriglyceridemic pancreatitis: an update. *Journal of Clinical Gastroenterology*.48(3):195–203. doi: 10.1097/01.mcg.0000436438.60145.5a.
11. He W. H., Zhu Y., et al. Comparison of severity and clinical outcomes between hypertriglyceridemic pancreatitis and acute pancreatitis due to other causes. Zhonghua yi xue za zhi. 2016;96:2569–2572.
12. Vipperla K., Somerville C., Furlan A. (2017), Clinical Profile and Natural Course in a Large Cohort of Patients with Hypertriglyceridemia and Pancreatitis. *Journal of Clinical Gastroenterology*.51(1):77–85.

DOI:10.31579/ 2690-8816/130