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Familial Pancreatic Hyperenzymemia

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Questions

Asymptomatic chronic pancreatic hyperenzymemia is characterized by an increase in serum amylase and/or lipase concentrations and was first described by Pieper-Bigelow et al. [1], in 1990 who called the condition "asymptomatic chronic hyperamylasemia"; in 1991, Ventrucci et al. [2] found that, in some patients, pancreatic hyperamylasemia may also be associated with hyperlipasemia and, finally, in 1996, Gullo [3] found that other pancreatic enzymes may be increased and that there was a fluctuation of these molecules. A special form of asymptomatic chronic pancreatic hyperenzymemia is Chronic Non-Pathological Pancreatic Hyperenzymemia (CNPH) defined as persistent hyperenzymemia exclusively of pancreatic origin without pancreatic disease [4]. A patient with persistent hyperenzymemia exclusively of pancreatic origin without pancreatic disease with at least one member of the family having the same enzyme alteration can be diagnosed as having familial pancreatic hyperenzymemia [5]. We revised the current medical literature in order to evaluate the epidemiology, pathophysiology and genetic alteration of this particular group of subjects. Finally, we also report the possible link between familial pancreatic hyperenzymemia and familial pancreatic cancer.

Epidemiology

The exact incidence of asymptomatic chronic pancreatic hyperenzymemia is not known nor is that of CNPH. Within the group of patients having CNPH, familial pancreatic hyperenzymemia ranges from 4 [4] to 19.5% of cases [6]. This difference should be explained, at least in part, by the modality of the enrollment. In fact, the subjects in our study were recruited at the community hospital [4] whereas, in the study of Amodio et al. [6], the subjects with CNPH were referred to a tertiary center; thus, in the latter study, the incidence was probably enriched.

Pathophysiology

The mechanism of enzymatic alteration is not known because very few data exist regarding the regulation of the passage of enzymes from the acinars cell to the blood. In experimental animals, two mechanisms regulate this passage: one consisting of the direct secretion of digestive enzymes across the basolateral surface of the acinar cells towards the blood [7,8], the other consisting of a paracellular passage of enzymes already secreted into the duct system [9].

Finally, we found that about one-third of patients with chronic nonpathological pancreatic hyperenzymemia had abnormally high fecal calprotectin concentrations [10]. Calprotectin is a cytoplasmic antimicrobial component prominent in granulocytes, monocytes and macrophages, and its release is most likely a consequence of cell disruption and death; it is stable in the stool and resistant to proteolysis, and its determination in feces has been demonstrated to be useful for diagnosing various inflammatory and neoplastic diseases of the gastrointestinal tract [10]. In spite of the small number of subjects with CNPH who have been studied, this information represents novel information concerning this syndrome which should be evaluated for the possible link between intestinal ecology and pancreatic enzyme alteration.

Genetic

The familial distribution of CNPH indicates that its basis should be genetic, but the genetic alteration of the genes involved in pancreatic diseases, such as CFTR, SPINK-1 and PRSS-1 [11,12], did not confirm, at least in part, this hypothesis. In fact, of the 70 subjects studied 7 (10.0%) had CFTR gene mutations and none of these 7 subjects had the familial form of pancreatic hyperenzymemia [11]. In addition, only two subjects with familial pancreatic hyperenzymemia, belonging to two different families, were found to carry a mutation (1 with p.Ala148Val for PRSS1 and 1 with p.Asn34Ser for SPINK1) [12].

Pancreatic cancer

In 2007, Gullo et al. [13] reported that, of the 68 subjects who had benign pancreatic hyperenzymemia, six had relatives who had died of pancreatic cancer. In these subjects, Magnetic Resonance Imaging (MRI) of the pancreas was normal in all six while endoscopic ultrasonography was normal in five; in the sixth subject, parenchymal abnormalities (lobularity and hyperechoic strands) were present in the head of the pancreas. Two of the 10 relatives of these six subjects had pancreatic hyperenzymemia; in both these subjects, the MRI and endoscopic ultrasonography results were normal. Of the six study subjects, there were nine relatives who had died of pancreatic ductal cancer. Four of the six had only one relative, one had two family members with pancreatic cancer and another had three relatives with pancreatic cancer. Thus, those patients with a family history of CNPH associated with a family history of pancreatic cancer should be carefully followed clinically and with the use of imaging techniques [14].

Conclusion

Familial pancreatic hyperenzymemia is a benign condition and its pathophysiological mechanism is still unknown. An appropriate clinical and imaging follow-up should be carried out in those patients having this condition associated with familial pancreatic cancer.

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References

1. Pieper-Bigelow C, Strocchi A, Levitt MD (1990) Where does serum amylase come from and where does it go? Gastroenterol Clin North Am 19: 793-810.
2. Ventrucci M, Pezzilli R, Festi D (1991) Clinical significance of chronic hyperamylasemia. Dig Dis Sci 36: 1517-1522.
3. Gullo L (1996) Chronic nonpathological hyperamylasemia of pancreatic origin. Gastroenterology 110: 1905-1908.
4. Pezzilli R, Morselli-Labate AM, Casadei R, Campana D, Rega D, et al. (2009) Chronic asymptomatic pancreatic hyperenzymemia is a benign condition in only half of the cases: a prospective study. Scand J Gastroenterol 44: 888-893.
5. Gullo L (2000) Familial pancreatic hyperenzymemia. Pancreas 20: 158-160.
6. Amodio A, Manfredi R, Katsotourchi AM, Gabbrielli A, Benini L, et al. (2012) Prospective evaluation of subjects with chronic asymptomatic pancreatic hyperenzymemia. Am J Gastroenterol 107: 1089-1095.
7. Isenman LD, Rothman SS (1977) Transport of alpha-amylase across the basolateral membrane of the pancreatic acinar cell. Proc Natl Acad Sci U S A 74: 4068-4072.
8. Miyasaka K, Rothman SS (1981) Endocrine secretion of alpha-amylase by the pancreas. Am J Physiol 241: G170-175.
9. Saito A, Kanno T (1973) Concentration of pancreozymin as a determinant of the exocrine-endocrine partition of pancreatic enzymes. Jpn J Physiol 23: 477-495.
10. Pezzilli R, Barassi A, Morselli-Labate AM, Fantini L, Tomassetti P, et al. (2007) Fecal calprotectin and elastase 1 determinations in patients with pancreatic diseases: a possible link between pancreatic insufficiency and intestinal inflammation. J Gastroenterol 42: 754-760.
11. Gullo L, Mantovani V, Manca M, Migliori M, Bastagli L, et al. (2005) Mutations of the CFTR gene in idiopathic pancreatic hyperenzymemia. Pancreas 31: 350-352.
12. Gullo L, Laghi L, Migliori M, Lucrezio L, Bianchi P, et al. (2008) SPINK1 and PRSS1 mutations in benign pancreatic hyperenzymemia. Pancreas 37: 31-35.
13. Gullo L, Migliori M, Fusaroli P, Caletti G (2007) Familial association of benign pancreatic hyperenzymaemia and pancreatic cancer. Gut 56: 1323-1324.
14. Pezzilli R, Fabbri D, Imbrogno A (2012) Pancreatic ductal adenocarcinoma screening: New perspectives. World J Gastroenterol 18: 4973-4977.

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