Exocrine Pancreatic Function in Chronic Pancreatitis with and without Calcification

JOHN PUNNOSE, V BALAKRISHNAN, A BHADRAH, KV KRISHNA DAS
Department of Gastroenterology and Medicine, Medical College Hospital, Trivandrum 695 011.

Abstract

Faecal fat and trypsin activity of the meal stimulated duodenal aspirate were estimated in 30 patients with tropical pancreatitis (TP). 15 of whom had radiological evidence of pancreatic calcify and the remaining did not. The same estimations were also done in ten healthy volunteer controls. The mean ± SD trypsin activity (MTA) was 19.6 ± 3.51 μEq/min/ml in controls, 6.2 ± 3.91 in patients with noncalcinic pancreatitis and 2.75 ± 2.92 in those with calcified pancreatitis, the difference between the MTA of the noncalcified group and the calcific group being significant (P < 0.02). Ninety per cent of the pancreatitis patients showed subnormal (< 1.24 μEq/min/ml) duodenal trypsin activity and steatorrhoea. No correlation was found between the severity of steatorrhoea and the level of trypsin activity.

Key words: Chronic pancreatitis, exocrine pancreatic function, Lundh test, steatorrhoea, diabetes in tropics.

Introduction

Tropical pancreatitis (TP) is a distinct clinical syndrome seen among young people in many tropical countries. The exocrine pancreatic function is variably impaired in this disease.1-3 Estimation of trypsin activity in the duodenal aspirate following a test meal (Lundh test) has been found to be a simple, physiological and inexpensive test in the evaluation of exocrine pancreatic function.4 The sensitivities of the Lundh test and secretin-pancreozymin test were similar in 5 of 8 comparative studies.4

Sixty per cent of TP patients have radiologically demonstrable pancreatic calcify.5 In chronic pancreatitis it has been claimed that calcification eventually occurs in all patients6 and that calcification and pancreatic dysfunction progress with time.7 However, no correlation studies have been done in TP between the exocrine function and calcification. This study was undertaken to find out if in TP there is any correlation between pancreatic calcification and the degree of exocrine dysfunction as measured by duodenal trypsin activity and steatorrhoea.

Material and Methods

Thirty patients with chronic pancreatitis who satisfied the following criteria were included in the study: diabetes mellitus of juvenile onset and recurrent epigastric pain typical of pancreatitis. Fifteen patients showed radiological evidence of pancreatic calcify while the other 15 did not (noncalcific pancreatitis). The mean age of the calcific group was 24 years (range: 17-36) and of the noncalcific group 23 years (15-47). Ten healthy volunteers between 15 and 35 years of age (mean 25) formed the control group. Diabetes mellitus and pancreatic calcify were excluded in the controls.

Exocrine pancreatic function was evaluated by estimating the 24 hours' stool fat10 (after a fat load of 100 g daily for 6 days) and trypsin activity in the duodenal aspirate by the Lundh test.9 A trypsin activity of 12.4 μEq/min/ml (mean—SD) was considered to be the lower limit of normal in this study. A faecal fat of > 6 g/24 hours was taken as indicative of steatorrhoea. A standard d-xylene test was performed in all patients using 5 g of d-xylene orally.10

Student's t test was used for statistical evaluation of unpaired samples.

Results

The mean duration of diabetes was 4.1 years (range 1-15) in the calcific group and 2.75 years (0-1-6) in the noncalcific group. The mean daily insulin requirements in these groups were 90 and 74 units (P > 0.2). The mean duration of abdominal pain was 5 years in the calcific and 3-35 years in the noncalcific groups.

The 2 hour mean trypsin activity (MTA) in the controls was 19.6 ± 3.51 μEq/min/ml. The MTA value in the calcific group (2.75 ± 2.92) was significantly lower than in the noncalcific group (6.2 ± 3.91; P < 0.02) and both were lower (P < 0.01) than in controls. Twenty seven of the 30 patients (90%) had subnormal duodenal trypsin activity (Fig).

The incidence of steatorrhoea in the calcific and noncalcific groups was 87 and 93 per cent respectively. D-xylene test was normal in all the patients. No linear relationship could be established between the stool fat values and deficiency of trypsin.

Discussion

The present study reveals a high incidence of exocrine pancreatic dysfunction in TP. The trypsin activity in our patients, both calcific and noncalcific, was significantly lower than in controls. We found a significant gradation in the duodenal trypsin activity between the calcific and noncalcific groups. In the calcific group, gross suppression of trypsin activity (< 2 μEq/min/ml) was found in 14 of 15 patients (93%) whereas in the noncalcific group, a similar degree of suppression was noticed in only 27%. Moreover, the noncalcific patients...
studies using secretin-pancreozymin tests have shown that the enzyme that was maximally affected in TP was lipase.1,5

Thus, there is considerable exocrine dysfunction in TP and the duodenal tryptic activity correlates with the presence of pancreatic calcification. However, no correlation was noticed between the degree of steatorrhea and calcification, or between steatorrhea and tryptic activity.

References


EXOCRINE FUNCTION IN TROPICAL PANEERATIDES—PUNNOSSE ET AL.