Gut, 1983, **24**, 781–783

Alimentary tract and pancreas

Association between duodenal bulb ulceration and reduced exocrine pancreatic function

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SUMMARY Seventy two patients admitted to a medical department with dyspepsia but without a previous diagnosis of peptic ulcer disease or chronic pancreatitis were studied consecutively. A pancreatic function test (Lundh meal test) and an upper endoscopy was made in all patients. There was no difference in age, sex ratio, occurrence of upper abdominal pain or chronic alcoholism between the groups of patients with reduced pancreatic function (20) and the group with normal function (52). Seven duodenal ulcers were found, two in patients with normal pancreatic function (2/52=3·8%; 95% conf lim: 0·5–13·2) and five in patients with reduced pancreatic function (5/20=25%; 95% conf lim: 8·7–49·1). This difference was statistically significant ($p<0·01$). Duodenitis occurred with equal frequency in the two groups.

Many studies have found a high prevalence of duodenal ulcers among patients with chronic pancreatitis,[1–5] thereby supporting the hypothesis that duodenal ulcers are caused by an increased acidity in the proximal duodenum.

This finding of an unusually high prevalence may, however, be the result of a 'detection bias'[6] caused by the intensive search for duodenal ulcers in a selected group of patients – that is, patients with chronic pancreatitis. In this way ulcers with atypical or no symptoms may be included, causing a higher prevalence of duodenal ulcers to be found than that known to occur in the background population. This could lead to the conclusion that an association exists between the two diseases, even if this is not so.

The present study investigates the association between duodenal ulcer disease and reduced pancreatic function in a group of patients suspected of chronic pancreatitis because of dyspeptic symptoms.

Methods

Seventy two consecutive patients primarily suspected of chronic pancreatitis (ratio F:M=33:39; median age 45 years, range 22–73 years) were included in the study because of the criteria listed in Table 1. Patients with known peptic ulcer or pancreatic disease and patients previously treated with cimetidine were excluded. The majority of patients (45/72) were included because of upper abdominal pain. The exocrine pancreatic function was evaluated with the Lundh meal test.[7] Patients with a meal stimulated duodenal lipase concentration <240 kU/l were classified as having reduced pancreatic function, whereas patients with a concentration ≥240 kU/l were considered as having normal exocrine pancreatic function. The two groups were comparable with regard to sex ratio, age, symptomatology, and alcoholism (Table 2). Patients with acute pancreatitis were not studied earlier than three months after the last attack.

Table 1 *Entry criteria and criteria for exclusion from the study*

A Criteria for inclusion in the study	*B Criteria for exclusion from the study*
Upper abdominal pain	Known peptic ulcer disease
Chronic alcoholism	Previous treatment with cimetidine
Diarrhoea and/or steatorrhoea	Known chronic pancreatitis
Previous attacks of acute pancreatitis	Pancreatic function test performed previously
Development of insulin dependent diabetes mellitus in middle age	
Haemochromatosis	

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Received for publication 1 November 1982

Table 2 *Comparison between the two groups of patients*

	Normal pancreatic function	*Reduced pancreatic function*
Number	52	20
Sex-ratio (F:M)	25:27	8:12
Age (years)		
Median	47	42
Range	25–73	22–72
Upper abdominal pain	32 (62%)	13 (65%)
Chronic alcoholism	19 (37%)	10 (50%)

Table 3 *Association between duodenal ulcer and exocrine pancreatic function*

	Duodenal ulcer			
Pancreatic function	*n*	*%*	*(95% conf lim)*	χ^2
Normal	2/52	3·8	0·5–13·2	5·15
Reduced	5/20	25·0	8·7–49·1	p<0·01

Without knowledge of the result of the pancreatic function test a gastroduodenoscopy was performed, using Olympus GIF-K or GF B2. In addition to the assessment of whether an ulcer was present or not the duodenal mucosa was characterised macroscopically using the duodenitis-score system (DS) described by Venables *et al.*[8] In this system which grades severity as well as extent of inflammatory changes, scores of two or more were considered to reflect duodenitis.

Two biopsies were taken from the duodenal mucosa, one from the top of the bulb, the other from the bottom of the bulb. The histological evaluation of the biopsies were done after the last patient had entered the study without the pathologist knowing the result of the Lundh test or the endoscopic findings. Histologically duodenitis was graded according to the scale proposed by Whitehead *et al.*[9]

Alcohol consumption was evaluated in all patients, and 'chronic alcoholism' indicates a daily intake of more than 50 g of ethanol during the last five years.

All statistic calculations were performed with the χ^2 test, corrected for small numbers.

Results

The exocrine pancreatic function was reduced in 20 of the 72 patients and seven patients had a duodenal ulcer. As shown in Table 3, two ulcers occurred in the group of 52 patients with normal pancreatic function, while five of the 20 patients with chronic pancreatitis had an ulcer – that is, prevalences of 3·8% and 25% respectively (p<0·01).

Duodenitis was a more frequent finding than duodenal ulcerations (Table 4) with no correlation to the exocrine pancreatic function.

Twenty nine of the patients were chronic alcoholics, and the pancreatic function was reduced in 10 of these cases. No association was found between duodenal ulcer and chronic alcoholism.

Discussion

The high prevalence of duodenal ulcer we have found in patients with reduced pancreatic function is in agreement with that reported from studies on patients with pancreatic insufficiency.[1–5] The present study has, however, looked for ulcer disease with equal intensity in the 'control group', consisting of patients with similar symptoms and a normal pancreatic function. In this way a 'detection bias' has been avoided. The prevalence of duodenal ulcer in our study is, of course, affected by the criteria used for selection of patients, but as the criteria were identical for all 72 patients our conclusion that peptic ulcer occurs more frequently among patients with an abnormal pancreatic function than it does among patients with a normal function is valid.

The Lundh meal test used in this study to measure exocrine pancreatic function has been shown to correlate satisfactorily with the output of pancreatic enzymes during stimulation with secretin and chole-

Table 4 *Association between duodenitis and exocrine pancreatic function*

	Endoscopic duodenitis			*Histological duodenitis*		
Pancreatic function	*n*	*%*	*(95% conf lim)*	*n*	*%*	*(95% conf lim)*
Normal	14/52	27	15–41	31/52	59	45–73
Reduced	9/20	45	23–68	13/19*	68	43–87

* One case not included because the biopsy contained too little tissue.

cystokinin, and the diagnostic sensitivity of the meal test in patients with suspected or verified chronic pancreatitis is almost as high as that of the secretin-CCK test.[10–12]

As an impaired neutralisation of acid instilled into the duodenum[13 14] and a decreased postprandial duodenal pH[15] has been found in pancreatic insufficiency, it is reasonable to suggest that the pathophysiological background for the association between the two diseases is an increased luminal acidity in the proximal duodenum.

We have included findings of duodenitis in this study because the relation between duodenal ulcer disease and duodenitis is an open and debated question. The findings reported here do not support an association between these two conditions.

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