PANCREATIC FUNCTION TESTS IN TROPICAL SPRUE IS PANCREAS INVOLVED?

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Summary

Pancreatic functions were studied in 15 patients with tropical sprue. The diagnosis of tropical sprue was made on accepted criteria of demonstrating malabsorption of at least two unrelated food substances in the absence of any other cause for malabsorption in patients residing in a tropical zone. Exogenous secretin (Boots) in a dose of one clinical unit per kg was employed for direct stimulation of exocrine pancreatic secretion. Of the 15 patients, 12 showed normal pancreatic functions. In two patients, volume output was marginally low i.e. 1.6 and 1.6 ml/kg/hr respectively (Normal value > 1.8 ml/kg/hr). In the third patient, volume output was normal but maximum bicarbonate concentration in pancreatic juice was 61.6 mEq/litre (Normal value > 80 mEq/litre). None of these three patients, however, had abnormalities in both the parameters of exocrine pancreatic function. Although pancreatic hyposecretion has been reported in patient with tropical sprue when indirect stimulation with Lundh meal was applied to pancreas, yet on direct stimulation with secretin, we found pancreatic functions to be normal. It is therefore concluded that the pancreas is not primarily involved in tropical sprue.

Key Words: bicarbonate, pancreatic function, secretin, tropical sprue.

Tropical sprue is a common cause of primary malabsorption in India and other tropical countries. The disease is characterised by malabsorption of various food constituents as a result of primary mucosal absorption defect. Enough information is available about the status of intestinal structure and functions in tropical sprue. However, not much work has been done to assess the pancreatic functions in this disease. This is important because involvement of pancreas can significantly increase the degree of steatorrhoea and its consequences. Besides, if pancreatic dysfunction is contributing to steatorrhoea in patients of tropical sprue, pancreatic enzyme replacement can be a valuable mode of therapy in this disease.

In the literature, only a few reports are available on pancreatic functions in tropical sprue. Brown and Ashford reported diminished pancreatic function in Tropical sprue. However, their methods for diagnosis of tropical sprue were inadequate according to the current knowledge of the subject. Morales found no evidence of pancreatic dysfunction in patients...
of Tropical sprue. Klipstein also thought that the pancreas was not involved in this condition. On the other hand Balagopal et al. in a study of pancreatic function tests in 24 normal persons and 24 patients of tropical sprue found a statistically significant reduction in the concentrations of trypsin, amylase and esterase in duodenal juice of tropical sprue patients. However, the method of pancreatic-stimulation used by them employed a test-meal as described by Lundh. This provides an indirect stimulation to pancreas and therefore depends on the integrity of duodenal mucosa for optimum release of hormones secretin and pancreozymin. Since proximal small bowel mucosa is also involved in tropical sprue, indirect stimulation is not ideal for assessment of pancreatic functions.

To obviate this drawback, we have studied pancreatic functions in 15 patients of tropical sprue employing direct stimulation of pancreas with exogenous secretin.

**Material and Methods**

15 patients (11 males and 4 females) of tropical sprue in the age range of 15 to 52 years (Mean = 32.2 years) were studied. The diagnosis of tropical sprue was made on accepted criteria of demonstrating malabsorption of at least two unrelated food substances, in the absence of any other known cause for malabsorption. All patients had chronic diarrhoea, weight loss and anaemia. Jejunal biopsies showed villous atrophy of varying degree in all patients. The patients were put on 6 week's course of tetracycline (1 gm daily) and folic acid (5 mg BD) and all of them showed improvement in diarrhoea and gained weight.

Haemogram, repeated stool examinations to exclude helminthiasis, jejunal aspirate for giardia trophozoites, blood urea, blood sugar, S. proteins and skiagrams of chest and abdomen were done on every patient. All patients underwent faecal fat estimation, d-xylose absorption test, schilling test, jejunal biopsy and a barium meal follow through examination for small bowel.

The pancreatic function was assessed by using secretin stimulation test. After an overnight fast, a poly vinyl tube was introduced orally and manoeuvred fluoroscopically so that its tip lay in the fourth part of duodenum. A separate tube was introduced to aspirate the gastric contents. Continuous gastric suction was applied throughout the period of test so as to prevent mixing of acid gastric juice with the duodenal fluid. Fasting duodenal juice was discarded.

Secretin (The Boots Co. Ltd., Nottingham, England) in a dose of one unit per kilogram body weight, dissolved in 10 ml of sterile water was injected intravenously. No untoward reactions were observed in any of the patients. The uncontaminated duodenal juice was then aspirated and collected in glass beakers surrounded by ice, in three twenty-minute samples and the tube withdrawn.

The duodenal juice was then analysed for volume output and maximum bicarbonate concentration (in milliequivalents per litre). The latter was calculated by estimating the amount of CO₂ produced after reaction with 0.1 NH₂SO₄ in a Vanslyke apparatus.

**Results**

The results of various investigations are listed in Table 1. Anaemia of varying degree was found in most of the patients (Mean Hb = 10.73 ± 2.39 g%). Repeated stool examinations revealed no ova or cysts and jejunal aspirate was negative for giardia trophozoites. Mild hypoalbuminaemia 2.9 to 4.5 g/dl (Mean ± SD = 3.6 ± 0.41) was the only biochemical abnormality in some of the patients. Skiagrams of chest and abdomen (mainly to see for pancreatic calcification) were normal in all patients.