Pancreolauryl Test—A Tubeless Test in Chronic Pancreatitis

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Abstract

We assessed the usefulness of the pancreolauryl test in 20 patients with proven pancreatitis and 21 control subjects. The test showed a sensitivity, specificity and negative predictive value of 100% each.

Key words: Pancreolauryl test, pancreatic function test, chronic pancreatitis

Introduction

Since the pioneering work of Chiray et al in 1930 on the evaluation of the 'secretin test' in pancreatic disease, a variety of tests has been developed to document lowered exocrine pancreatic function by estimating the enzyme or bicarbonate output into the duodenum on direct (hormonal) or indirect (dietetic) stimulation of the pancreas. Although these tests are highly sensitive, they involve the inconvenience of intraduodenal intubation, the methods are cumbersome and the results cannot be well reproduced. Tubeless tests have, therefore, been recently developed. Of these, the BT-PABA (benztropine) test has been widely studied. The pancreolauryl test was developed as far back as in 1969, but only a few clinical studies have appeared in the literature. No such study is available from India although pancreatitis forms a special problem in the tropics. We undertook to evaluate the sensitivity and specificity of the test in diagnosed cases of chronic pancreatitis.

The test is based on estimating in a 10 hour urine sample the amount of free fluorescein absorbed from the gut, where it is released by enzymatic breakdown of orally administered fluorescein dilaurate by pancreas specific cholesterol-ester hydrolase.

Material and Methods

The two study groups included 20 patients with chronic pancreatitis proven by endoscopic retrograde pancreatography (ERP) and/or pancreatic calcification on plain X-ray abdomen and 21 control subjects (without pancreatic, hepatobiliary or renal diseases). Controls consisted of healthy persons (2), patients with pulmonary tuberculosis, diabetes mellitus and psoriasis (2 each), and one each with rheumatoid arthritis, pain in the abdomen of obscure origin, fever of unknown origin, hypogammaglobulinemia with chronic diarrhea, empyema, lymphoma, systemic lupus erythematosus, motor neuron disease, polymyositis, myasthenia gravis, stroke, focal seizures and compressive myelopathy.

Procedure

We followed the procedure outlined in the product information supplied by Temmler-Werke, Marburg, West Germany, who provided the test material.

Vitamin and enzyme preparations are stopped the day before the test. After an overnight fast, the subject voids urine in the morning and ingests two blue capsules (containing 348.5 mg of fluorescein dilaurate) together with a standard test breakfast consisting of 4 bread slices, 20 g butter, 1 egg and 200 ml milk. The subject does not eat or drink again for three hours. Thereafter, he is allowed to drink one litre of permitted liquids (water, dilute tea, dilute lemon or orange squash) over the next 2 hours, and subsequently is allowed normal food and drinks. The urine is collected for ten hours from the time of ingestion of capsules. The total urinary volume is measured, mixed thoroughly and 10 ml is retained for analysis.

The test is repeated on the second day with control capsule (one red capsule containing 188.14 mg of fluorescein sodium). Fluorescein in the urine is estimated spectrophotometrically at 492 nm. The quantity of fluorescein excreted on the test and control days is estimated according to the following formula:

\[ \text{Extinction at 492 nm} \times \text{urine vol (ml)} \]

\[ = \text{Dye excretion as \% of dose administered.} \]

To evaluate the test, the T/K quotient is derived from the equation:

\[ \frac{T \times 100}{K} \]

where T and K are the fluorescein excretion levels following ingestion of the test and control capsules respectively. The T/K quotient serves as a measure for the assessment of exocrine pancreatic function. T/K values greater than 30% are taken as normal and less than 20% as indicating exocrine pancreatic insufficiency.

Results

The data of the two groups are summarised in the Table. Of the 20 patients, 16 underwent successful retrograde endoscopic pancreatography which showed a dilated and irregular main duct in all the cases, two patients had technical difficulties (in them pancreatic calcification was gross on plain X-ray) and two had calcification diagnosed at surgery.
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<th>Table: Characteristics of subjects and test results</th>
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T = Percentage excretion after test capsule
K = Percentage excretion after control capsule.

Analysing the test day values (T) using a cut-off point at 10%, a sensitivity of 100% but specificity of 85-71% was observed (Fig 2).

Fig 2: Test day values in controls and patients, with a cut-off value of 10%.

Discussion

Our study has shown a 100% sensitivity with the pancreolauryl test. Reported sensitivity values have ranged from 63% to 100%. Other studies have however reported significantly lower sensitivity values (38% and 71%) in mild pancreatic insufficiency. All the studies have shown increasing sensitivity rates with increasing pancreatic insufficiency. The high sensitivity in our study may be attributed to our small sample size and a preselection of cases with moderately advanced pancreatic insufficiency. Our study has also shown a high specificity of 100%, comparable to the specificity value of 94.4% in the original report.

The specificity values in other studies ranged from 46% to 94%.48

False-positive tests have been reported in conditions like cholestasis, gastric resection or gastrointestinal bypass, intestinal mucosal defects like chronic inflammatory bowel disease and coeliac disease, and intestinal bacterial overgrowth. Eriksson observed that the activity of pancreatic esterase, the enzyme essential for the pancreolauryl test, is strongly dependent on bile salt. The present study, however, has not shown any false-positive test, possibly as a result of the composition of the control group.

The present study, therefore, indicates the clinical utility of a simple tubeless test in moderately advanced cases of pancreatic insufficiency. The main limitation of the pancreolauryl test is its low sensitivity in detecting cases of mild pancreatic insufficiency. Being an indirect stimulation test, its outcome may depend on adequate hormonal release from the gut mucosa after a standard breakfast. This simple and reliable test may also be used as an outpatient screening test.
References


