95 IN VITRO EFFECTS OF PANCREATIC PROTEASES ON P PRECURSOR OF RAT INTESTINAL SUCRASE-ISOMALTASE (S-I)

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Pancreatic proteases are known to be involved in the cleavage of the P precursor of S-I in its two subunits S and I after its insertion to the brush-border (BB) membrane. The aim of this study was to determine in vitro the respective role of trypsin (T) and elastase (E) in this post-insertional process. Duodenum biliary-pancreatic attachments were transposed in rat (DT) to ileum leaving the jejunum devoid of these secretions. One month after surgery, DT and control rats (C) received 5mCi ^{35}S-methionine IP and were killed 5hrs latter. SI-immuno electrophoresis from jejunal BB revealed only P in DT and S and I in C. BB of DT (250µg) were incubated with E (5-20mU/ml) or T (100-5000mU/ml) for 30 and 60mn at 37°C. E induced a major solubilization of P, a poor cleavage of P in 2 abnormal bands and an inactivation of S and I activities. T, for 30mn, cleaved P in normal I and S. 60mn incubation resulted in the apparition of a 3rd band I' (MW:I>I'>S). A solubilization of the cleaved S and I was also observed. Our results suggest that, besides the solubilization role of E and T, T is the main pancreatic enzyme implicated in the normal cleavage of P in its 2 subunits I and S and in the obtention of the normal balance between S and I activities. Depending of pancreatic protease concentrations in the digestive lumen in vivo, abnormal physiological S-I subunits should be found.

96 FAECAL CHYMOTRYPSIN, A BETTER TEST OF EXOCRINE PANCREATIC FUNCTION

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Intraduodenal tests of pancreatic function are invasive, expensive and time consuming. The measurement of pancreatic chymotrypsin in faeces is a commonly used alternative but it has not been adequately validated. We have assessed the test by simultaneous measurements of duodenal and faecal chymotrypsin in 30 children, aged 3 weeks to 13 years, with exocrine pancreatic function ranging from nil (5) through partial insufficiency (1) to normal function (24). Duodenal fluid was collected for 5 consecutive 10 minute periods following i.v. pancreozymin (2 units /kg). Apparent secretion rates (ug/kg/50 mins.) and mean concentrations of chymotrypsin were determined. Mean faecal chymotrypsin concentration was determined from 3 random stools passed on separate days within 72 hours of the intraduodenal test. In the 25 children with measurable pancreatic function, the mean faecal chymotrypsin concentrations were significantly positively correlated with both duodenal chymotrypsin apparent secretion rate and mean concentration (Spearman's rank correlation coefficient 0.63 and 0.45, $p = <0.001$ and <0.01 respectively). The 5 children with undetectable levels of duodenal chymotrypsin had very low faecal chymotrypsin concentrations of only 3-10% of the lower limit of the reference range (120 ug/100 g stool). The child with reduced but measurable duodenal chymotrypsin had a faecal chymotrypsin of 33% of the lower limit. All 24 children with normal function had mean faecal chymotrypsin concentrations within the reference range. Faecal chymotrypsin is a rapid, simple, cheap, readily repeatable, non-invasive test which should always be done before contemplating intraduodenal assessment of pancreatic function.