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ST VINCENT'S PATHOLOGY

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LIPASE INFORMATION SHEET

PHYSIOLOGY

The lipase routinely measured in plasma is pancreatic lipase (Enzyme Commission number EC 3.1.1.3. triacylglycerol acyl lipase). It has a molecular weight of 39-56,000 and consists of 449 amino acids with an active site serine at position 152. The gene is on chromosome 10. Lipase is secreted from the exocrine pancreas into the duodenum where it breaks down triglycerides at the glycerol fatty acid bond in positions 1 and 3 producing α-monoglyceride. It acts only at a fat-water interface which is stabilised by co-lipase, an essential cofactor. Lipase is broken down during passage through the small intestine by chymotrypsin.

Lipase in the serum is filtered at the glomerulus and completely metabolised by the renal tubules. Half life in plasma is 7-13 hours. Other lipases in the body include lipoprotein lipase (EC 3.1.1.34) and hepatic lipase (EC 3.1.1.3) however these do not cross-react in current lipase assays. Lipase is also found in the gastric fundus and antrum, however it is thought that the concentrations are so low compared to the pancreas as to be insignificant clinically.

PATHOLOGY

Plasma levels of lipase are raised in pancreatitis and show greater than 90% sensitivity for this disease. Specificity is increased using 3 x the upper limit of normal as a decision point. Lipase levels increase within 4-8 hours of an attack of acute pancreatitis, peak at 24 hours and remain elevated for 8-14 days. Lipase is not elevated with salivary gland disease, tubo-ovarian disease, pleural effusion, renal failure or macroamylaseaemia. Any cause of release of pancreatic enzymes into the blood stream may cause elevated plasma lipase, such as gall stones, bowel obstruction, intestinal infarction, duodenal ulcer, or opiate administration. Plasma lipase shows greater sensitivity and specificity for pancreatitis than is shown by plasma amylase. The increased sensitivity is seen most markedly in alcoholic patients where amylase is a relatively poor marker of pancreatitis.