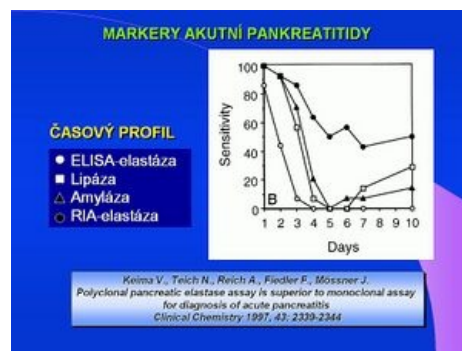


Pancreatic elastase

Elastase-1 (EC 3.4.21.11) is secreted as proelastase and activated by trypsin. We distinguish between elastase-1 (Mr 30,000; anodic fraction), which occurs in serum as a free-form and as a complex with an α_1 -proteinase inhibitor, and elastase-2 (Mr 25,000; cathodic fraction). The enzyme is secreted into the pancreatic juice, which is then secreted into the duodenum and the protein sequence selected for immunochemical detection is not degraded during intestinal passage. In inflammatory processes, there is also retrograde release into the bloodstream, and quantification of serum levels of human pancreatic elastase is a suitable marker of acute pancreatitis, such as in post-ERCP and pancreatic cancer. Elastase-1 (determined by ELISA) has the highest specificity and sensitivity of all pancreatic enzymes for pancreatic cancer. Elastase-1 levels are elevated in both acute and chronic recurrent pancreatitis, and the increase persists longer and correlates better with clinical status than α -amylase levels. RIA methods with 125 I-labeled elastase or newer ELISA techniques utilizing a monoclonal antibody specific to elastase-1 are used to determine elastase-1. Elastase-1 (determined by ELISA) has the highest specificity and sensitivity of all pancreatic enzymes for pancreatic cancer. The reference range (for the RIA methodology) is 1.3-4.3 $\mu\text{g} / \text{l}$. The latest innovation in the determination of serum elastase-1 is based on a latex immunoassay.



Markers of acute pancreatitis

Determination of elastase-1 (EL-1) in stool

Human pancreatic elastase-1 is synthesized by pancreatic acinar cells. The enzyme is secreted into the pancreatic juice, which is then secreted into the duodenum and the protein sequence selected for immunochemical detection is not degraded during intestinal passage. The detection of elastase in stool therefore is of high diagnostic value. Unlike the chromogenic method of determining fecal chymotrypsin, the determination of fecal lipase is not important. Human pancreatic elastase-1 activity in stool samples reflects the degree of exocrine pancreatic function. Recent applications recommend the determination of pancreatic elastase-1 in duodenal juice in a stimulated functional test. Stool elastase-1 determination is of clinical importance in the differential diagnosis of malabsorption syndrome, as a screening test for pancreatic disease, and for long-term follow-up of patients with chronic pancreatitis. The laboratory method is based on ELISA with a monoclonal (or polyclonal) antibody specific to human pancreatic elastase. The stool sample is homogenized in the extraction buffer solution, and after a dilution of 1: 500, a standard ELISA procedure on a microtiter plate with POD-streptavidin detection is performed. The kit contains 5 calibration standards in the range of 0.3-10.0 ng / mL.



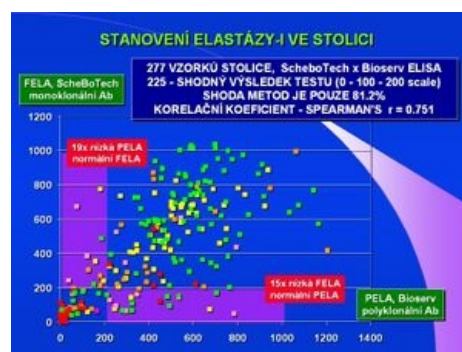
Determination of elastase-1 (EL-1) in stool

The reference values are 200–500 $\mu\text{g} / \text{g}$ stool, the cut-off range is 100–200 $\mu\text{g} / \text{g}$, severe pancreatic insufficiency is determined at values <100 $\mu\text{g} / \text{g}$ stool. Immunochemical determination of elastase-1 is not affected by colonic passage, replacement therapy, or other factors that affect the enzymatic determination of chymotrypsin in the stool. The specificity of the method is 93%, while the sensitivity reaches 100% for severe pancreatic insufficiency and 87% for mild and light forms. This test is commonly used in pediatrics to diagnose cystic fibrosis with a specificity and sensitivity of almost 100%. False reduction in the value may be due to dilution during diarrhea (due to higher water content).

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