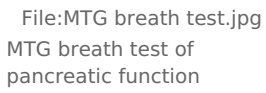
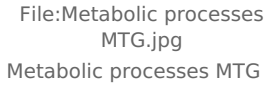
13C-mixed triacylglyceride breath test

Principle


File:MTG breath test.jpg
MTG breath test of pancreatic function

The principle of the breath test with ^{13} C-mixed triglycerides is the cleavage of this substrate by pancreatic lipase. ^{13} C-MTG substrate is a triglyceride with ^{13} C-labeled octanoate in position 2 and stearate in positions 1 and 3. Pancreatic lipase cleaves the triglyceride and ^{13} C-octanoate is further oxidized in liver (beta-oxidation fats). In exhaled air, the amount of ^{13} CO_2 is determined by the breath test analyzer. A variant is a test with another substrate for lipase - Hiolein. The specificity of the assay depends on the structure of the substrate, which affects the kinetics of hydrolysis.

Performs an MTG-BT test


File:Metabolic processes MTG.jpg
Metabolic processes MTG

The patient must be fasted and discontinuation of pancreatic replacement at least 24 hours prior to the start of the test. Indirect stimulation with the test meal involves crispy cornbread with 50 g of fat (preferably vegetable margarine) to which 100 mg of ^{13} C-labeled triglyceride is added. An air sample is taken before serving the test meal, and then for 6 hours at 30-minute or 60-minute intervals. Samples can be analyzed by IRMS or IR type analyzers. The evaluation is the cumulative output in 6 hours, which in percent of the administered substrate expresses the degree of pancreatic insufficiency. The limit of the standard is 22% for the MTG-BT test when calculating the cumulative output using BSA (body surface area calculated using the patient's height and weight). More accurate values can be calculated using BMR (basal metabolic rate) taking into account the sex and age of the patient. The limit of the standard for calculating BMR is 30%.

Clinical significance

The MTG-BT test is of clinical importance in the differential diagnosis of Malabsorption Syndrome, as a functional test of pancreatic exocrine function and for long-term follow-up of patients with chronic pancreatitis. Breath tests with ^{13} C-mixed triglycerides (MTG-BT), or ^{13} C-Hiolein are indirect functional tests exocrine function pancreas and can be used to monitor the success of pancreatic replacement therapy.

Links

Related Articles

- Breath tests

Resources

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