

Carbon-13 mixed triglycerides breath test

Principle

The principle of the **13 C-mixed triglyceride breath test (MTG-BT test)** 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 the liver (beta-oxidation of fats). The amount of 13 CO₂ in the exhaled air is determined by a 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.

Performing of the MTG-BT test

The patient must be fasting and must discontinue the pancreatic replacement at least 24 hours before the start of the test. Indirect stimulation with the test meal includes crispy cornbread with 50 g of fat (preferably vegetable margarine) to which 100 mg of C 13-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 (isotope-ratio mass spectrometry) 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 %.

The clinical significance

The MTG-BT test is of clinical importance in the differential diagnosis of malabsorption syndrome, as a functional test of exocrine pancreatic 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 of pancreatic exocrine function and can be used to monitor the success of pancreatic replacement therapy.

Links

Sources

- se svolením autora převzato z KOCNA, Petr. *GastroLab : MiniEncyklopedie laboratorních metod v gastroenterologii* [online]. ©2002. Poslední revize 2011-01-08, [cit. 2011-03-04]. <<http://www1.lf1.cuni.cz/~kocna/qlab/glency1.htm>>.
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