

Lactulose/mannitol intestinal passage test

Intestinal passage tests

Intestinal passage test are valuable in diagnosing diseases of the small intestine, malabsorption syndrome, especially celiac disease. For the measurement of intestinal passage you can use a lot of markers(monosaccharides, disaccharides,⁵¹Cr-EDTA, polyethyleneglycol – PEG) respectively - their combinations. In the Czech republic, the most used test is a lactulose/mannitol (LA/MA test), which can be combined with cellobiose or with saccharosis. Lactulose is a marker of a paracellular absorption. E.g. during celiac disease the intercellular connection loosens and the space between cells widens and that increases the passage of lactulose. Mannitol is a marker of active transport through a cell (enterocyte) and in celiac disease the absorption of mannitol lowers by the reduction of a active surface which happens because of an atrophy of the intestinal wall. LA/MA intestinal permeability test can be used in monitoring of a postop chemotherapy.

Lactulose/mannitol test

Can be given with D-xylose, this version of the test was developed by ÚKBD in Hradec Králové. Solution of 10 g of lactulose, 2 g of mannitol, 2 g of D-xylose and 11 g of glucose in 100 ml of distilled water is given orally to the patient. The hyperosmolarity 1500 mosm/l increases the sensitivity of the test. Patient must be fasting (12 hrs, normally through the night) and after drinking the solution their urine must be collected for 5 hours. The analysis of each saccharide is made by using gas chromatography, the relative amount of each saccharide is measured against the given amount and the end LA/MA LA/XY permeability indexes are calculated. The average LA/MA index in a control group is $0,016 \pm 0,008$, LA/XY index is $0,013 \pm 0,009$. Some other studies advise to use wider combinations of the three substrates, e.g. by adding sucralose, which is stable while passing the large intestine, other studies recommend the combine test of passage and lactose LDI/SAT index.

Links

Literature

- MELICHAR, B, et al. Intestinal permeability and vitamin A absorption in patients with chemotherapy-induced diarrhea. *Am J Clin Oncol*. 2008, vol. 31, no. 6, s. 580-4, ISSN 0277-3732 (Print), 1537-453X (Electronic). PMID: 19060591.
- VILELA, EG, et al. Intestinal permeability and antigliadin antibody test for monitoring adult patients with celiac disease. *Dig Dis Sci*. 2007, vol. 52, no. 5, s. 1304-9, ISSN 0163-2116 (Print), 1573-2568 (Electronic). PMID: 17356917.
- KOETSE, HA, et al. Combined LDI/SAT test to evaluate intestinal lactose digestion and mucosa permeability. *Eur J Clin Invest*. 2006, vol. 36, no. 10, s. 730-6, ISSN 0014-2972 (Print), 1365-2362 (Electronic). PMID: 16968469.
- ANDERSON, AD, et al. A simple method for the analysis of urinary sucralose for use in tests of intestinal permeability. *Ann Clin Biochem*. 2005, vol. 42, s. 224-6, ISSN 0004-5632 (Print), 1758-1001 (Electronic). PMID: 15949159.
- DUERKSEN, DR, et al. Intestinal permeability in long-term follow-up of patients with celiac disease on a gluten-free diet. *Dig Dis Sci*. 2005, vol. 50, no. 4, s. 785-90, ISSN 0163-2116 (Print), 1573-2568 (Electronic). PMID: 15844719.
- ZUCKERMAN, MJ, et al. Assessment of intestinal permeability and absorption in cirrhotic patients with ascites using combined sugar probes. *Dig Dis Sci*. 2004, vol. 49, no. 4, s. 621-6, ISSN 0163-2116 (Print), 1573-2568 (Electronic). PMID: 15185867.
- SECONDULFO, M, et al. Ultrastructural mucosal alterations and increased intestinal permeability in non-celiac, type I diabetic patients. *Dig Liver Dis*. 2004, vol. 36, no. 1, s. 35-45, ISSN 1590-8658 (Print), 1878-3562 (Electronic). PMID: 14971814.
- DI LEO, V, et al. Lactulose/mannitol test has high efficacy for excluding organic causes of chronic diarrhea. *Am J Gastroenterol*. 2003, vol. 98, no. 10, s. 2245-52, ISSN 0002-9270 (Print), 1572-0241 (Electronic). PMID: 14572575.
- HESSELS, J, et al. Assessment of intestinal permeability: enzymatic determination of urinary mannitol, raffinose, sucrose and lactose on Hitachi analyzer. *Clin Chem Lab Med*. 2003, vol. 41, no. 1, s. 33-8, ISSN 1434-6621 (Print). PMID: 12636047.
- INUTSUKA, S, et al. Assessment of the intestinal permeability following postoperative chemotherapy for human malignant disease. *Eur Surg Res*. 2003, vol. 35, no. 1, s. 22-5, ISSN 0014-312X (Print), 1421-9921

(Electronic). PMID: 12566783.

- MELICHAR, B, et al. Intestinal permeability in patients with chemotherapy-induced stomatitis. *J Cancer Res Clin Oncol.* 2001, vol. 127, no. 5, s. 314-8, ISSN 0171-5216 (Print), 1432-1335 (Electronic). PMID: 11355146.
- KOHOUT, P. Small bowel permeability in diagnosis of celiac disease and monitoring of compliance of a gluten-free diet (gut permeability in celiac disease). *Acta Medica (Hradec Kralove).* 2001, vol. 44, no. 3, s. 101-4, ISSN 1211-4286. PMID: 11811077.
- VOGELSANG, H, et al. In vivo and in vitro permeability in coeliac disease. *Aliment Pharmacol Ther.* 2001, vol. 15, no. 9, s. 1417-25, ISSN 0269-2813 (Print), 1365-2036 (Electronic). PMID: 11552914.
- JOHNSTON, SD, et al. Intestinal permeability tests in coeliac disease. *Clin Lab.* 2001, vol. 47, no. 3-4, s. 143-50, ISSN 1433-6510. PMID: 11294577.

Source

- ws:Laktulózo/mannitolový test střevní propustnosti
- 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/glab/glency1.htm>>.