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Adding a liquid test meal to a standardized lactulose hydrogen breath test significantly influences abdominal symptom generation and hydrogen values

Valeria Schindler [1], Juliane Hente [1], Fritz Ruprecht Murray [1], Martin Hüllner [2], Anton S Becker [3], Stéphanie Giezendanner [4], Larissa Schnurre [1], Valentine Bordier [5], Daniel Pohl [1]

Affiliations

Affiliations

1 Division of Gastroenterology and Hepatology.
2 Department of Nuclear Medicine.
3 Institute of Diagnostic and Interventional Radiology, University Hospital Zurich, Zurich.
4 Centre for Primary Health Care, University of Basel, Basel.
5 St. Clara Ltd, St Claraspital, Basel, Switzerland.

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Abstract

Objective: While single sugar tests are controversially discussed, combination tests with meals are gaining more attention. The aim of this study was to analyze the impact of adding a test meal to lactulose hydrogen breath tests (LHBT) on hydrogen values and abdominal symptoms in patients with functional gastrointestinal disorders (FGIDs).

Methods: Data of 81 FGID patients between 2014-2018 were analyzed. Patients underwent LHBT with 30 g lactulose + 300 mL water and a nutrient challenge test (NCT) including 400 mL liquid test meal + 30 g lactulose. To statistically assess the effect of a test meal on abdominal symptoms and H2, mixed-effect models were used.

Results: Adding a test meal to LHBT showed a significant increase in nausea [odds ratio (OR) 1.4; 95% confidence interval (CI), 1.1-1.7], decrease in abdominal pain (OR 0.7; 95% CI, 0.6-0.9), borborygmi (OR 0.5; 95% CI, 0.4-0.6), diarrhea (OR 0.4; 95% CI, 0.3-0.6), and H2 production (estimate -5.3, SE 0.7, $P < 0.001$). The effect on bloating was only significant in functional dyspepsia, irritable bowel syndrome-functional dyspepsia mixed type and functional abdominal pain/bloating (OR 0.1; 95% CI, 0.0-0.2; OR 1.7; 95% CI, 1.2-2.3 resp OR 4.4; 95% CI, 1.8-10.6).

Conclusions: Significant effects on abdominal symptoms and H2 production by adding a test meal to LHBT in FGID patients are shown. Increased occurrence of nausea may be caused by gastric/duodenal hypersensitivity; decreased H2, diarrhea and borborygmi by slower and more physiologic gastric emptying resulting in later arrival of the test substance in the bowel. We recommend NCTs instead of LHBT to more physiologically represent FGID patients' meal-induced burden.

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