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Relevance of symptom questionnaires and hydrogen breath tests in suspected lactose or fructose intolerance

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INTRODUCTION

Up to 50% of patients with Irritable Bowel Syndrome (IBS) experience carbohydrate intolerances[1]. The European Guideline[2] recommends combining hydrogen breath testing for malabsorption with symptom assessment using the validated **adult Carbohydrate Perception Questionnaire aCPQ**[3].

This study investigates:

- the relationship between abdominal symptom severity in the patients' history **(Bowel Disease Questionnaire, BDQ)** and results of malabsorption and intolerance testing.
- the dietary response in patients with carbohydrate intolerance (pos. aCPQ), with or without malabsorption.

METHODS

A retrospective analysis was conducted on 1,139 tests from 708 patients (62% female, mean age 42±16 years) referred for evaluation of suspected carbohydrate intolerance between 02/2017 and 06/2024 to the Medical Universities of Graz and Vienna.

Study design is summarized in the flowchart *(Figure 1).* **Malabsorption was assessed using hydrogen breath tests, intolerance by aCPQ** following ingestion of the respective test substrate. Symptom intensity (for diarrhea, bloating, nausea, flatulence and abdominal pain) over the preceding six months was recorded using the **BDQ**. Patients with a **positive aCPQ** were advised to **follow a diet**; at follow-up, symptom intensity during the prior 10 days was reassessed and symptom change (deltaVAS) was calculated.

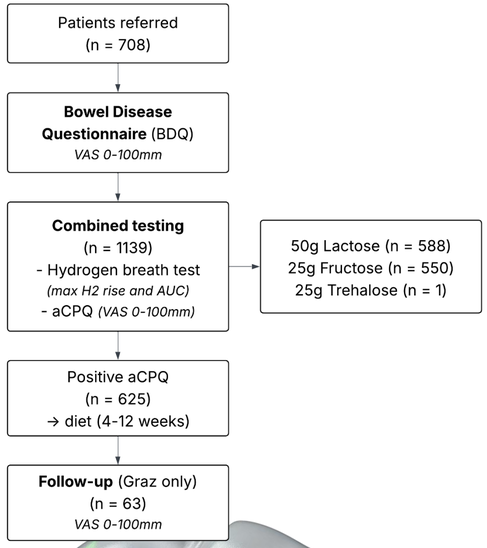

Figure 1. Flowchart of study design

RESULTS

1. 625 Tests indicated intolerance (pos. aCPQ), 373 malabsorption (pos. breath test), 271 were positive and 414 negative in both.
2. In patients with **aCPQ-diagnosed intolerance**, weak but significant positive **correlations were found** for all symptoms **between the severity in the BDQ and maximum intensity in the aCPQ** (r from 0.17 to 0.31; p<0.001), strongest for bloating and weakest for diarrhea. These correlations were observed in both the lactose and fructose group, regardless of malabsorption status. **No significant correlation was found between BDQ symptom severity and breath test results.**
3. In patients with **intolerance,** VAS scores **improved for all symptoms during diet (p<0.001). Symptom reduction (deltaVAS) strongly correlated with symptom severity in the BDQ** for all five symptoms (r from 0.54 to 0.84; p<0.001), **while breath test results did not predict dietary response**. The correlation between deltaVAS and BDQ symptom severity for the symptom average of the five symptoms is shown in *Figure 2.*

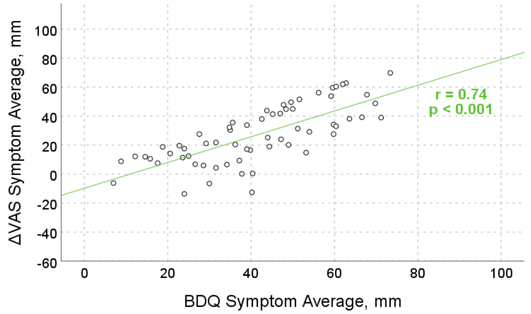

Figure 2. Correlation between deltaVAS and BDQ symptom severity for symptom average of the five symptoms

Symptom severity in the aCPQ showed weak correlations with deltaVAS for nausea (r=0.32; p=0.012) and bloating (r=0.37; p=0.003)

CONCLUSIONS

- Diagnosis of intolerance using the aCPQ identifies patients who benefit from dietary intervention.
- Patients with the most severe baseline symptom history respond best to diet.
- Symptom history is a weak predictor of carbohydrate intolerance, and breath tests are not useful for explaining baseline symptoms or guiding treatment.

1 Frieling T. *DGVS* 2015
2 Hammer HF et al. *UEG J* 2022;10:15-40. doi:10.1002/ueg2.12133
3 Hammer J et al. *Eur J Gastroenterol Hepatol* 2021;32:171–177. doi:10.1097/MEG.0000000000001880.