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Fructose malabsorption is associated with decreased plasma tryptophan.

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Abstract

BACKGROUND: Fructose malabsorption is characterized by the inability to absorb fructose efficiently. As a consequence fructose reaches the colon where it is broken down by bacteria to short fatty acids, CO2, H2, CH4 and lactic acid. Bloating, cramps, osmotic diarrhea and other symptoms of irritable bowel syndrome are the consequence and can be seen in about 50% of fructose malabsorbers. Recently it was found that fructose malabsorption was associated with early signs of depressive disorders. Therefore, it was investigated whether fructose malabsorption is associated with abnormal tryptophan metabolism.

METHODS: Fifty adults (16 men, 34 women) with gastrointestinal discomfort were analyzed by measuring breath hydrogen concentrations after an oral dose of 50 g fructose after an overnight fast. They were classified as normals or fructose malabsorbers according to their breath H2 concentrations. All patients filled out a Beck depression inventory questionnaire. Blood samples were taken for plasma tryptophan and kynurenine measurements.

RESULTS: Fructose malabsorption (breath deltaH2 production >20 ppm) was detected in 35 of 50 individuals (70%). Subjects with fructose malabsorption showed significantly lower plasma tryptophan concentrations and significantly higher scores in the Beck depression inventory compared to those with normal fructose absorption.

CONCLUSIONS: Fructose malabsorption is associated with lower tryptophan levels that may play a role in the development of depressive disorders. High intestinal fructose concentration seems to interfere with L-tryptophan metabolism, and it may reduce availability of tryptophan for the biosynthesis of serotonin (5-hydroxytryptamine). Fructose malabsorption should be considered in patients with symptoms of depression and disturbances of tryptophan metabolism.

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