Short-Chain Carbohydrates and Functional Gastrointestinal Disorders

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Carbohydrates occur across a range of foods regularly consumed including grains such as wheat and rye, vegetables, fruits, and legumes. Short-chain carbohydrates with chains of up to 10 sugars vary in their digestibility and subsequent absorption. Those that are poorly absorbed exert osmotic effects in the intestinal lumen increasing its water volume, and are rapidly fermented by bacteria with consequent gas production. These two effects alone may underlie most of the induction of gastrointestinal symptoms after they are ingested in moderate amounts via luminal distension in patients with visceral hypersensitivity. This has been the basis of the use of lactose-free diets in those with lactose malabsorption and of fructose-reduced diets for fructose malabsorption. However, application of such dietary approaches in patients with functional bowel disorders has been restricted to observational studies with uncertain efficacy. As all dietary poorly absorbed short-chain carbohydrates have similar and additive effects in the intestine, a concept has been developed to regard them collectively as FODMAPs (fermentable oligosaccharides, disaccharides, monosaccharides and polyols) and to evaluate a dietary approach that restricts them all. In patients with irritable bowel syndrome, there is now an accumulating body of evidence, based on observational and comparative studies, and on randomized-controlled trials that supports the notion that FODMAPs trigger gastrointestinal symptoms in patients with functional bowel disorders, and that a diet low in FODMAPs offers considerable symptom relief in the majority of patients who use it.

(2013). American Journal of Gastroenterology, 108(5), 707-717.