Child and Parent Perceived Food-Induced Gastrointestinal Symptoms and Quality of Life in Children with Functional Gastrointestinal Disorders

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ABSTRACT

It is unknown whether children with functional gastrointestinal (GI) disorders identify specific foods that exacerbate their GI symptoms. The objectives of this study were to determine the perceived role of food on GI symptoms and to determine the impact of food-induced symptoms on quality of life (QOL) in children with functional GI disorders. Between August and November 2010, 25 children ages 11 to 17 years old with functional GI disorders and a parent completed a food symptom association questionnaire and validated questionnaires assessing FGID symptoms and QOL. In addition, children completed a 24-hour food recall, participated in focus groups to identify problematic foods and any coping strategies, and discussed how their QOL was affected. Statistical analyses were conducted using $\chi 2$, *t* test, Mann-Whitney *U* test, Wilcoxon signed rank, and Spearman's ρ. Children identified a median of 11 (range=2 to 25) foods as exacerbating a GI symptom, with the most commonly identified foods being spicy foods, cow's milk, and pizza. Several coping strategies were identified, including consuming smaller portions, modifying foods, and avoiding a median of 8 (range=1 to 20) foods. Children reported that food-induced symptoms interfered with school performance, sports, and social activities. Although the parent's assessment of their child's QOL negatively correlated with the number of perceived symptom-inducing foods in their child, this relationship was not found in the children. Findings suggest that specific foods are perceived to exacerbate GI symptoms in children with functional GI disorders. In addition, despite use of several coping strategies, food-induced symptoms can adversely impact children's QOL in several important areas.

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FUNCTIONAL GASTROINTESTINAL (GI) DISORDERS, such as irritable bowel syndrome (IBS), functional abdominal pain, and functional dyspepsia, are prevalent, affecting approximately 10% to 25% of school-aged children.[1-3] These disorders often cause substantial morbidity and lead to school absences, increased use of health care resources, and decreased quality of life (QOL). Unfortunately, these disorders are often chronic, with up to 65% of children with functional GI disorders becoming adults with functional GI disorders.[4,5]

The etiology of functional GI disorders is thought to be multifactorial, including altered brain–gut interactions, genetic predispositions, and/or environmental factors, such as diet.[3,6] Twenty-five percent to 75% of adults with IBS report specific food-induced worsening of their GI symptoms, such as abdominal pain and diarrhea.[7] Adults with IBS identify diets high in carbohydrates, fatty foods, coffee, alcohol, and hot spices as the primary culprits.[8] Avoidance of certain foods can improve GI symptoms, as demonstrated through dietary interventions that promote avoidance of foods high in fermentable oligosaccharides, disaccharides, monosaccharides, and polyols in some adults with functional GI disorders.[9] However, adults who self-impose dietary restrictions without medical supervision might reduce their intake of important nutrient-containing foods and impair overall nutrition.[7,10]

The perceived role of specific foods on GI symptoms in children with functional GI disorders is unknown. In addition, how perceived food-induced GI symptoms might relate to QOL has not been evaluated. The study hypothesis was that children with functional GI disorders and their parents would identify specific foods that exacerbated their GI symptoms and negatively affected their QOL. The study also hypothesized congruence between children and parents on which specific foods worsened GI symptoms. Therefore, both qualitative and quantitative methods were used to investigate these relationships.

METHODS

Subjects

Children ages 11 to 17 years who were diagnosed with and actively experiencing GI symptoms because of an FGID were recruited via mail, phone, pediatric gastroenterology clinic visits, newsletters, and advertisements at the Children's Nutrition Research Center and Texas Children's Hospital. Children were enrolled from August 2010 to November 2010. Children were determined to have an FGID if they experienced abdominal discomfort for longer than 3 months without an identified metabolic, neoplastic, anatomic, or inflammatory (eg, inflammatory bowel disease) etiology for their symptoms.[11] Children were included if they had been evaluated by a physician within 1 year of enrollment without an organic etiology identified (eg, celiac) for their GI symptoms and if their GI symptoms were reportedly exacerbated by food(s). The majority of children (22 of 25 [88%]) had seen a pediatric gastroenterologist. Children were excluded if they had previously undergone an abdominal surgical procedure (eg, cholecystectomy) or if they and/or their parents were unable to speak English, as the questionnaires used were only validated in English and focus groups were conducted solely in English.

The study was cross-sectional in design, for this was the first attempt to describe the phenomenon of perceived food intolerance in our population that would be representative of real-world findings typically found in a clinical setting. Informed written consent was obtained from the parent, and assent was obtained from the child. The study was approved by the Baylor College of Medicine and the Texas Woman's University Institutional Review Boards.

During the study visit at the Children's Nutrition Research Center, a 24-hour food recall, in which the children had previously recorded all foods consumed within the past 24 hours, was reviewed with the child by an interviewer. Interviewers included registered dietitian nutritionists, physicians, and research coordinators who were trained to review dietary recalls and administer the questionnaires. All meals with their individual food components (eg, type of bread eaten from a sandwich) and snacks were reviewed during the visit, and appropriate changes made to the 24-hour food recall record as needed. Children and parents were interviewed individually in separate, private rooms by the assigned interviewer. The questionnaires were administered in the following order:

Rome III Diagnostic Criteria Questionnaire

The Rome III Diagnostic Criteria Questionnaire was utilized to identify the presence and severity of GI symptoms and to determine FGID subtypes.[11] Children completed the questionnaire on their own. Likewise, parents filled out the parent-proxy questionnaire in reference to their child.

Food Symptom Association Questionnaire

Because a validated food symptom association questionnaire is not available in children, a local questionnaire that listed 97 foods or food types (eg, spicy foods) was developed (Figure). The foods listed in the questionnaire were based, in large part, on foods included in the Harvard Youth/Adolescent Food Frequency Questionnaire.[12] The investigators, as deemed applicable to our population, determined modifications of the foods asked. For example, foods such as beer, wine, and liquor were eliminated from the questionnaire. Additions included gas-producing foods (eg, watermelons, cherries, cabbage, etc) and foods with high sugar content, which can exacerbate GI symptoms in those with functional GI disorders.[13]

An assessment of symptoms, severity, avoidance of foods, and frequency of symptoms with food ingestion mirrored that used in an adult questionnaire, as no validated pediatric questionnaire was available.[8] The interviewer administered the food questionnaire. Participants were instructed to identify any food causing a GI symptom (ie, abdominal pain, nausea, vomiting, bloating, flatulence, satiety, diarrhea, reflux, and constipation). If a GI symptom was noted, the questionnaire then prompted the interviewer to ask the severity of the symptom(s) (rated on a 0 to 4 scale; "none," "little," "some," "bad," and "very bad"), the frequency of symptom(s) with ingestion (rated on a 0 to 4 scale; "none," "rarely," "sometimes," "often," or "always"), and whether the food was regularly avoided (yes/no). At the end of the questionnaire, participants were also asked if they felt "all foods" exacerbated their own or their child's GI symptoms.

Pediatric Quality of Life Inventory Generic Core Scale

The Pediatric Quality of Life Inventory is a standardized, age-appropriate, self-administered measure addressing physical, emotional, social, and school functioning health-related QOL.[14] The questionnaire quantifies QOL on a 0 to 100 scale, with 100 being the highest QOL score possible. Parents completed the parent-proxy Pediatric Quality of Life Inventory on their own, which contained the same questions as the child version.

The Pediatric Quality of Life Inventory Gastrointestinal Symptom Scale

Validated solely as a parent-proxy form, the Pediatric Quality of Life Inventory Gastrointestinal Symptom Scale was completed by the parents only, who rated their child's frequency of experiencing eight different GI symptoms (eg, abdominal pain).[15] The Gastrointestinal Symptom Scale follows the same 0 to 100 scale as the Pediatric Quality of Life Inventory, with 100 reflecting no GI symptoms.

After completion of the questionnaires, children were asked to participate in a focus group. A total of eight different focus group sessions occurred that were age-specific, with children ages 11 to 14 years and 15 to 17 years being grouped separately. The focus groups were led by an experienced, qualitative moderator and audiotaped for later review. The moderator presented pictures of 82 different foods on flash cards to guide children in identifying foods that affected symptoms to determine what coping strategies, if any, were used when dealing with symptom-inducing foods, and to discuss whether and how their QOL might be affected. Probing questions were used to expand and clarify responses. Flash cards for all the foods from the food questionnaire were not included when a food type was believed to be too broad to represent in one picture (eg, fast foods, fried foods). However, these types of foods were identified during discussion of specific foods (eg, chicken and its preparation). Notes during the focus groups were also taken by one of the authors for additional review and analysis.

Data Analysis

SPSS software (version 19.0, 2010, The Predictive Analytics Company, SPSS Inc) was used to analyze the data. Continuous data were compared between groups using parametric (eg,