

# Relationship of Gastrointestinal Symptoms and Psychosocial Distress to Gastric Retention in Children

Gregory K. Wong, MD<sup>1,2</sup>, Robert J. Shulman, MD<sup>1,2,3</sup>, Hoda M. Malaty, MD, MPH, PhD<sup>4,5</sup>, Danita Czyzewski, PhD<sup>1,2</sup>, Victor J. Seghers, MD<sup>1,2</sup>, Deborah Thompson, PhD<sup>1,3</sup>, and Bruno P. Chumpitazi, MD, MPH<sup>1,2</sup>

**Objectives** To determine whether gastrointestinal (GI) symptoms (abdominal pain, nonpain GI symptoms, nausea) and/or psychosocial distress differ between children with/without gastroparesis and whether the severity of GI symptoms and/or psychosocial distress is related to the degree of gastroparesis.

**Study design** Children aged 7-18 years (N = 100; 63 female patients) undergoing a 4-hour gastric emptying scintigraphy study completed questionnaires evaluating GI symptoms, anxiety, and somatization for this prospective study. Spearman correlation, Mann-Whitney, *t*-test, and  $\chi^2$  tests were used as appropriate for statistical analysis.

**Results** Children with gastroparesis (n = 25) were younger than those with normal emptying ( $12.6 \pm 3.5$  vs  $14.3 \pm 2.6$  years,  $P = .01$ ). Because questionnaire responses from 7- to 10-year-old children were inconsistent, only patient-reported symptoms from 11- to 18-year-olds were used. Within this older group (n = 83), children with gastroparesis (n = 17) did not differ from children with normal emptying in severity of GI symptoms or psychosocial distress. In children with gastroparesis, gastric retention at 4 hours was related inversely to vomiting ( $r = -0.506$ ,  $P = .038$ ), nausea ( $r = -0.536$ ,  $P = .019$ ), difficulty finishing a meal ( $r = -0.582$ ,  $P = .014$ ), and Children's Somatization Inventory score ( $r = -0.544$ ,  $P = .024$ ) and positively correlated with frequency of waking from sleep with symptoms ( $r = 0.551$ ,  $P = .022$ ).

**Conclusions** The severity of GI symptoms and psychosocial distress do not differ between children with/without gastroparesis who are undergoing gastric emptying scintigraphy. In those with gastroparesis, gastric retention appears to be inversely related to dyspeptic symptoms and somatization and positively related to waking from sleep with symptoms. (*J Pediatr* 2014;165:85-91).

**G**astroparesis is a gastrointestinal (GI) motor disorder in which the emptying of the stomach is abnormally delayed in the absence of an anatomic obstruction. The reported prevalence of gastroparesis in adults varies widely, ranging from ~0.04% to 4%.<sup>1-4</sup> The pediatric prevalence of gastroparesis is unknown.

Normal GI motility depends on the integrity of the central, autonomic, and enteric nervous systems, along with the interstitial cells of Cajal and smooth muscle cells of the GI tract.<sup>5</sup> Compromise of any of these components can potentially alter GI motility, causing such disorders as gastroparesis, intestinal pseudo-obstruction, and intractable constipation.<sup>6-8</sup> More than 70% of gastroparesis cases in children are idiopathic but likely postinfectious in nature.<sup>9,10</sup>

Gastroparesis symptoms in adults and children are nonspecific and may include abdominal pain, nausea, vomiting, bloating, and early satiety.<sup>11-13</sup> Hence, the nature of these symptoms often makes gastroparesis difficult to diagnose, as other disease processes, both GI and psychosocial, can manifest with the same symptomatology.<sup>14</sup> The clinical diagnosis of gastroparesis in children can be challenging because of young children's difficulty in describing and reporting symptoms.

Gastric emptying scintigraphy (GES) provides an objective measure of gastric emptying.<sup>15</sup> The use of a standardized meal in GES has allowed the determination of normal GES values in adults.<sup>16,17</sup> Children can easily complete the same protocol and use the same established values.<sup>18</sup> However, GES does not necessarily reveal which symptoms, if any, are related to gastroparesis. Studies in adults have yielded conflicting results in regard to the potential relationship between gastroparesis and GI symptoms or psychosocial distress, which also can affect motility.<sup>12,13,19-22</sup> Additionally, these studies did not assess the GI symptoms of abdominal pain or discomfort, which are thought to be common complaints in gastroparesis.<sup>3,23,24</sup>

From the <sup>1</sup>Department of Pediatrics, Baylor College of Medicine; <sup>2</sup>Texas Children's Hospital; <sup>3</sup>ARS/USDA Children's Nutrition Research Center; <sup>4</sup>Department of Medicine, Baylor College of Medicine; and <sup>5</sup>Michael E. DeBakey Veterans Affairs Medical Center, Houston, TX

Supported by the National Institutes of Health (NIH; R01 NR05337), The Daffy's Foundation, the US Department of Agriculture's Agricultural Research Service (6250-51000-043 to R.S.), and NIH/National Institute of Diabetes and Digestive and Kidney Diseases (P30 DK56338 to the Texas Medical Center Digestive Disease Center). B.C. was funded by the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition Foundation/Nestle Nutrition Young Investigator Development Award. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the US Department of Agriculture; mention of trade names, commercial products, or organizations does not imply endorsement by the US government. The authors declare no conflicts of interest.

0022-3476/\$ - see front matter. Copyright © 2014 Elsevier Inc.

All rights reserved.

<http://dx.doi.org/10.1016/j.jpeds.2014.02.063>

BARF	Baxter Retching Faces
CSI	Children's Somatization Inventory
GCSI	Gastroparesis Cardinal Symptom Index
GES	Gastric emptying scintigraphy
GI	Gastrointestinal
MM-RAP	Multidimensional Measurement of Recurrent Abdominal Pain

Our primary aims were to determine whether GI symptoms (abdominal pain, nonpain GI symptoms, nausea) and/or psychosocial distress (anxiety, somatization) differed between children with and those without gastroparesis. Our secondary aims were to determine if the severity of GI symptoms and/or psychosocial distress were related to the severity of gastroparesis.

## Methods

Children aged 7-18 years undergoing a standard solid meal GES study for outpatient evaluation of GI symptoms were prospectively included. Children with a history of GI surgery or organic GI disease (eg, inflammatory bowel disease) were excluded. We also excluded children with any degree of learning disability, neurocognitive delay, or disability that might affect their ability to complete the questionnaires. The study was approved by the Baylor College of Medicine Institutional Review Board.

Children scheduled for a GES study were identified via electronic medical records. Parental consent and child assent were obtained the day of the GES study. After the radiolabeled meal was consumed and the initial scintigraphic image was captured, children completed questionnaires addressing GI symptoms (eg, abdominal pain, nausea, vomiting); (Multidimensional Measurement of Recurrent Abdominal Pain [MM-RAP]<sup>25</sup> and the Supplemental Dyspepsia Questionnaire) and psychosocial comorbidities (State Trait Anxiety Inventory for Children<sup>26</sup> and Children's Somatization Inventory [CSI-24]<sup>27</sup>). The investigator read the questionnaires to children aged 7-10 years to control for reading comprehension difficulties. Child and parent were separated while the child completed the questionnaires, and the investigator was present at all times to address any questions. Questionnaires were scored as previously described, and GES results were recorded.<sup>25-27</sup>

Children fasted for  $\geq 8$  hours. All GES studies used the recommended meal of 2 pieces of white toast, 120 mL of scrambled egg substitute, a 0.5-oz packet of jelly, and 120 mL of water.<sup>17</sup> Technetium-99-labeled sulfur colloid was mixed in the egg substitute before cooking. Meals were consumed within a 10-minute period, after which the first scintigraphic image was obtained. Subsequent images were taken at 1-hour intervals over a 4-hour period. Children unable to consume the entire meal within a 10-minute period or who vomited within the 4-hour duration of the GES study were disqualified. Radiologists were blinded to questionnaire results. GES results were reported as the percentage of the meal remaining in the stomach at the 1-, 2-, 3-, and 4-hour time points of the study (ie, gastric retention values). Gastroparesis was defined as a gastric retention value  $>10\%$  at 4 hours.<sup>17</sup>

To evaluate abdominal pain and other GI symptoms, the MM-RAP and a Supplemental Dyspepsia Questionnaire (see later) were used. The MM-RAP is a 32-item scale of GI symptom severity covering both upper and lower GI symptoms, disability, and pain developed and validated for use

in the pediatric population with the primary focus on children with recurrent abdominal pain.<sup>25</sup> As recommended, composite scores were calculated for the scales of the MM-RAP (abdominal pain, other GI symptoms, and disability), and a total MM-RAP score was calculated by averaging the scores from the these scales.<sup>25</sup> Because we focused on GI symptoms, the non-GI symptom portion of the MM-RAP is not reported.

To evaluate nausea, we used the Baxter Retching Faces (BARF) scale, a validated visual rating of nausea in children.<sup>28</sup> Both average and maximum ratings of nausea were calculated.<sup>28</sup>

None of these scales include a measure of vomiting alone. Thus, we created a Supplemental Dyspepsia Questionnaire that included not only vomiting but also additional symptoms we believed to be clinically important (**Table I**; available at [www.jpeds.com](http://www.jpeds.com)). Furthermore, because the MM-RAP has dual symptoms listed under some individual items (eg, nausea/vomiting), separate items addressing each symptom were added to the supplemental questionnaire.

The State Trait Anxiety Inventory for Children and CSI-24 were used to assess the levels of psychosocial distress.<sup>26,27</sup>

## Statistical Analyses

We calculated that to discern a 35% difference in the MM-RAP abdominal pain scale between groups (gastroparesis vs normal emptying) with 80% power and an  $\alpha$  error of  $<0.5$ , a total sample size of 75 subjects would be required. Mann-Whitney *U* test or Student *t* test was used as appropriate for the data for comparisons between children with and without gastroparesis. A  $\chi^2$  analysis was used when comparing nominal data between groups. Spearman correlation analysis was used to evaluate the potential relationships between gastric emptying and individual GI symptoms, the 3 scales of the MM-RAP, and psychosocial distress scores. Multivariate logistic regression analysis was used to identify groups of symptoms and/or scores that might be predictive of gastric emptying results. IBM Statistical Package for the Social Sciences (Armonk, New York) version 19 software was used for all statistical analysis. Data are shown as mean  $\pm$  SD or median and range as appropriate.

## Results

During 16-month study period, 100 children (63 female patients,  $13.3 \pm 3.2$  years old) were enrolled; 25 (25%) were diagnosed with gastroparesis. Children with gastroparesis were younger than those with normal gastric emptying but did not differ in sex, anthropometrics, or ethnicity (**Table II**).

More children in the 7- to 10-year-old group (47%) had gastroparesis than those in the 11- to 18-year-old group (20.5%, **Table II**). In both age groups, children with gastroparesis did not differ from those with normal gastric emptying in regard to sex, age (**Table II**), anthropometrics, or ethnicity (data not shown).

Download English Version:

<https://daneshyari.com/en/article/4164872>

Download Persian Version:

<https://daneshyari.com/article/4164872>

[Daneshyari.com](https://daneshyari.com)