Prevalence of Pain-Predominant Functional Gastrointestinal Disorders and Somatic Symptoms in Patients with Anxiety or Depressive Disorders

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Objective To determine whether children with symptoms of internalizing psychiatric disorders have a greater prevalence of pain-predominant functional gastrointestinal disorders (FGIDs) and migraine-like headaches.

Study design Children and adolescents aged 6-18 years were recruited from a behavioral health center (n = 31) and a primary care center (n = 36). Subjects completed *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*–based symptom inventory questionnaires to screen for internalizing psychiatric disorders, the Questionnaire on Pediatric Gastrointestinal Symptoms, and a somatic distress assessment interview.

Results Thirty-three subjects (19 of 31 from the behavioral health center and 14 of 36 from the primary care center) screened positive for symptoms of anxiety or depressive disorders. The remainder screened negative and served as controls. Pain-predominant FGIDs were more common in the group with symptoms of anxiety or depression compared with controls (prevalence, 51.5% vs 8.8%; $P = .0002$). Migraine headaches occurred in 57.6% of the subjects with internalizing psychiatric disorders vs 23.5% of the control group ($P = .006$). The prevalence of functional constipation did not differ significantly between the 2 groups. The data remained essentially unchanged when analyzed within each center of recruitment.

Conclusion Youths with anxiety or depressive symptoms are more likely to suffer from pain-predominant FGIDs and migraine-like headaches, but not from functional constipation. The lack of an association between functional constipation and internalizing psychiatric symptoms suggests that FGIDs associated with pain may bear a specific relationship to emotional disorders. *(J Pediatr 2013;163:767-70)*.

Recurrent gastrointestinal complaints constitute one of the most common reasons for medical consultation in preschool and school-age children. A population-based study showed that 60% of school-age children experienced at least 1 gastroenterologic symptom weekly, and that 10% of all children complained weekly of abdominal pain for at least 8 weeks.[1] Pain-predominant functional gastrointestinal disorders (FGIDs) comprise irritable bowel syndrome (IBS), functional dyspepsia, abdominal migraine, and functional abdominal pain. In all of these syndromes, there should be no evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the patient's symptoms.[2]

FGIDs impact quality of life, socialization, and school attendance. They have long-term psychological implications and significant economic impacts related to medical costs and missed work days.[3,4] The pathophysiology of FGIDs is thought to involve abnormalities in the relationship between the enteric and central nervous systems, among many other proposed etiologies.[5] There is also an increased prevalence of psychiatric symptoms and disorders in patients with FGIDs, most notably an increased prevalence of anxiety and depression.[6] Despite growing recognition that youth with FGIDs appear to be at heightened risk for emotional disorders, no previous study has used standardized assessments to assess the prevalence of FGIDs in children with and without comorbid internalizing psychiatric symptoms. The aim of the present study was to determine whether children with symptoms of internalizing psychiatric disorders have a greater prevalence of pain-predominant FGIDs and migraine-like headaches.

Methods

The Institutional Review Board at Nationwide Children's Hospital approved the study design. Children and adolescents aged 6-18 years were recruited from a behavioral health center (n = 31) and a primary care center (n = 36) in the Columbus, Ohio metropolitan area. There was no difference in the demographic

DSM-IV	*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*
FGID	Functional gastrointestinal disorder
IBS	Irritable bowel syndrome

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makeup of the subjects recruited from the 2 centers. The primary care center was chosen to serve as the main source of controls, and the behavioral health center was chosen to serve as the main source for the study subjects as opposed to controls. Sample size calculation was done to estimate the number of subjects needed on each arm. The reported prevalence of psychiatric diagnoses in patients with FGIDs ranges from 20% to 60%.[6] The sample size calculations were based on a 2-sided χ^2 test, $\alpha = 0.05$, and 80% power. We determined that 30-38 subjects were needed in each group to detect significance.

The investigator approached parents and potential subjects in the office waiting area of the primary care center, and informed consent and assent, when appropriate, were obtained. That was followed by completion of questionnaires on the same day. The parents/guardians of subjects from the behavioral health center were asked to complete a 1-page form during their initial visit, and they were contacted by the investigator if they gave permission to be contacted. They were then brought back to the gastrointestinal clinic or the behavioral clinic to meet with the investigator and complete the questionnaires.

Subjects were screened for symptoms of internalizing psychiatric disorders using the relevant sections of the Child/Youth Symptom Inventory, a *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV)-based checklist with sound psychometric properties. Symptoms of the following disorders were assessed: generalized anxiety disorder, specific phobia, panic disorder, obsessive compulsive disorder, posttraumatic stress disorder, social phobia, separation anxiety disorder, and major depressive disorder. The subjects had to choose and mark as "never," "sometimes," "often," and "very often" in response to each individual statement in the inventory, with responses of "often" or "very often" indicating a positive finding. Thresholds were established as significant for specific anxiety and depressive disorders beforehand. Subjects who exceeded the symptom threshold for at least 1 anxiety or depressive disorder were considered to have an internalizing psychiatric disorder. For example, individuals reporting at least 3 positive symptoms of generalized anxiety disorder or of major depressive disorder were categorized as suffering from a clinically significant anxiety or depressive disorder, respectively.

Subjects also completed the standardized Questionnaire on *Pediatric Gastrointestinal Symptoms, Rome III version*, which has 2 versions, a self-report for children aged ≥10 years and a parent-report version for younger children. This test is scored using standardized criteria to obtain different diagnoses of FGID. The current headache portion of the somatic distress assessment was administered to study subjects to identify youth with migraine headaches. The somatic distress assessment is an interviewer-based research assessment of somatic symptoms in children and adolescents aged 8 years through young adulthood that collects data required for the standardized diagnosis of somatic syndromes, such as migraine headache. A detailed medical history was also obtained to ensure the absence of findings suggestive of unrecognized physical diseases that could explain reported pain and gastrointestinal symptoms. Demographic information collected included age, race, sex, and socioeconomic status. All *P* values were calculated using a 2-sided Fisher exact test.

Results

Of the 31 subjects recruited from the specialty behavioral health setting, 19 (61%) screened positive for at least 1 DSM-IV anxiety or depressive disorder (mean age, 13.8 ± 1.7 years), and 12 (39%) were negative (mean age, 14.2 ± 1.8 years). The 2 groups did not differ with regard to age, sex ($P = .46$), race/ethnicity ($P = .42$), parental marital status ($P = .29$), or parent with whom they resided ($P = .68$). Of the 36 subjects from the primary care center, 14 (39%) had clinically significant symptoms of at least 1 DSM-IV anxiety or depressive disorder (mean age, 13.1 ± 2.4 years), and 22 (61%) did not appear to be suffering from an internalizing disorder (mean age, 12.7 ± 2.6 years). These groups also did not differ with regard to sex ($P = .14$), race ($P = .34$), parental marital status ($P = .27$), or parent with whom they resided ($P = .39$).

Initially, all subjects who screened positive for internalizing psychiatric disorders were compared with those who screened negative. Thirty-three subjects from both the behavioral health center and the primary care center were found to have an internalizing psychiatric disorder. Thirty-four subjects screened negative for internalizing psychiatric disorders and thus served as controls. We found a statistically higher prevalence of both pain-predominant FGID and migraine-like headaches in those with symptoms of internalizing psychiatric disorders vs controls (51.5% vs 8.8% [$P = .0002$] and 57.6% vs 23.5% [$P = .0062$], respectively). In contrast, the difference in the prevalence of functional constipation between the 2 groups was not statistically significant (Table I).

We further analyzed the data by comparing separately all subjects who screened positive for symptoms of anxiety and/or depression in the behavioral health center with controls and also those from the primary care center who screened positive for internalizing psychiatric disorders with the same controls. These analyses confirmed the same trend of an increased prevalence of pain-predominant

Table I. Prevalence of pain-predominant FGIDs, migraine headaches, and functional constipation in subjects with with internalizing psychiatric symptoms vs controls

	Anxiety/depression (n = 33)	Controls (n = 34)	*P* value
Pain-predominant FGIDs	17 (51.5)	3 (8.8)	.0002
Migraine headaches	19 (57.6)	8 (23.5)	.0062
Functional constipation	7 (21.2)	3 (8.8)	.1863

Data are n (%).