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Prevalence of Functional Gastrointestinal System Disorders Associated with Abdominal Pain in 6th, 7th and 8th Grade Students of Izmit Primary Schools

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Abstract **Original Research Article**

Purpose: This study is intended to determine the prevalence of functional gastrointestinal disorders associated with abdominal pain and the symptoms pertinent to these diseases in 6th, 7th, and 8th grade students in Izmit primary schools. ***Subject and Method:*** A total of 998 participants consisting of 6th-7th-8th grade students from five primary schools in Izmit were included in the study. The Roma III questionnaire, which questions the symptoms of functional gastrointestinal disorders, and a questionnaire revealing their sociodemographic characteristics were conducted on the participants. ***Results:*** In our study, 9.3% of 998 adolescents with a mean age of 13.03 years had at least one functional gastrointestinal disorder (FGD) associated with abdominal pain. The most commonly detected disorders were abdominal migraine (4.8%) and Irritable Bowel Syndrome IBS (3.9%), respectively. Functional dyspepsia (FD) turned out in 2.6%, while FGD associated with Abdominal Pain (FAPS) revealed in 0.8% and Functional Abdominal Pain (FAP) in 2.2%. ***Conclusion:*** Symptoms related to functional gastrointestinal disorders are frequently encountered in 10-15 year old students. This situation reduces their quality of life, and in turn their school attendance and may cause a decrease in their school success. Screening and treatment of these symptoms is of great importance in the primary step. The conduct of the Roma III questionnaire, which we adapted to Turkish, to patients with gastrointestinal complaints may facilitate the work of physicians.

Keywords: Functional Gastrointestinal Disorder (FGD), Abdominal Pain, Irritable Bowel Syndrome (IBS), Functional dyspepsia (FD).

1. INTRODUCTION

Functional Gastrointestinal Disorders (FGD) are conditions that cannot be completely explained by existing structural or biochemical tests, and include a combination of chronic or recurrent symptoms [1]. It was first mentioned in the body of literature by Apley in 1958, for at least 3 months, and three or more episodes of abdominal pain that are severe enough to affect daily activity was defined as the condition of having chronic abdominal pain in childhood and reported that it is most common in children between the ages of 5-15 [2]. The prevalence of nonspecific abdominal pain (NSCA) ranged from 4% to 10% in population and school-based studies [3].

In 2006, the Rome III criteria for the diagnosis of gastrointestinal disorders in children aged 4-18 years were announced (Table 1).

In our study, we aimed to determine the prevalence of those associated with abdominal pain 'Functional dyspepsia (FD), Irritable bowel syndrome (IBS), abdominal migraine, functional abdominal pain (FAP)' based on FGD with the Roma III questionnaire prepared based on Rome III criteria.

2. SUBJECT AND METHOD

A total of 998 students from grades 6th, 7th and 8th in Izmit primary schools were included in the study between January 1, 2011 and June 15, 2011.

Students younger than 10 or older than 15 and students who did not fill out the questionnaire were excluded in the study. Students were interviewed in classrooms under the supervision of teachers in five selected schools. After providing them with information about the study and obtaining their informed consent verbally, the students were included in the study.

The data of the study were presented to the students through the Rome III questionnaire. In addition, all students were handed out an educational brochure about the digestive system. We collected the answered questionnaires and evaluated them according to the Rome III criteria.

The information in the questionnaire form was recorded in the SPSS 20 program. Sociodemographic characteristics and prevalence of functional gastrointestinal disorders were calculated.

Table 1: Functional Gastrointestinal Disorders (FGD)

A. Functional Disorders: in children and adolescents
A1. Vomiting and Aerophagia
A1a. Adolescent Rumination Syndrome
A1b. Cyclic Vomiting Syndrome
A1c. Aerophagy
A2. FGD associated with Abdominal Pain
A2a. Functional Dyspepsia
A2b. Irritable Bowel Syndrome
A2c. Abdominal Migraine
A2d. Childhood Functional Abdominal Pain
A2d1. Childhood Functional Abdominal Pain Syndrome
A3. Constipation and Incontinence
A3a. Functional Constipation
A3b. Non-retentive fecal incontinence (without straining)

3. RESULTS

Sociodemographic Data

The mean age of the 998 students included in our study was 13.03 ± 0.83, and the age range was 11-15. Of the participants, 50% (n=499) were female and 50% (n=499) were male.

It should be represented that 85.7% of the mothers of the students participating in the study were housewives, whereas working mothers mostly worked as teachers, workers, and caregivers.

The median value of the number of days of absence of the students participating in the study for the previous semester was calculated to find the result of 1. The minimum number of days of school attendance was recorded as 0 and the maximum number of days of absenteeism was recorded as 22.

It may be argued that more than half of the absences of students are by reason of getting sick. In addition, gastrointestinal system (GIS) symptoms are considered responsible for nearly one-third of the disorders that cause absenteeism. 265 students reported no absences. Of the 722 students who were absent, 580 (80.3%) reported that they could not attend school because they were sick.

293 (29.7%) of the 985 students who answered the question “Did you have one or more of the ailments such as abdominal pain, nausea, vomiting, diarrhea, constipation, or bloating in the stomach if the reason for your absence is a sickness? selected the option “yes”.

The students were asked about their own school achievements, and the result revealed is that the average was calculated as seven out of 10.

Data on Disorders

In our study, 93 (9.3%) of 998 students had FGD associated with abdominal pain according to the Turkish Roma III scale. Of these, 45 (48.4%) were male students and 48 (51.6%) were female students. Our examination of these disorders separately revealed functional dyspepsia (FD) detected in 26 (2.6%), IBS in 39 (3.9%), FCS in 8 (0.8%), 22 (2.2%), and abdominal migraine in 48 (4.8%) students. Of the FD students, 5 (19.2%) were male and 21 (80.8%) were female. Of the students with IBS, 22 (56.4%) were male and 17 (43.6%) were female. Of the 8 students with FKAS, 6 (75%) were boys and 2 (25%) were girls. Of the students with FCA, 12 (54.5%) were male and 10 (45.5%) were female, and of the 48 students with abdominal migraine, 11 (2s2.9%) were male and 37 (77.1%) were female.

IBS, FCS and FCA were examined separately in two groups as those associated with lower abdominal pain and those associated with upper abdominal pain. While the frequency of IBS lower abdominal pain was 2.5%, the frequency of IBS upper abdominal pain was recorded at 1.9%. The frequency of FCS lower abdominal pain was 0.6%, and the frequency of FCS upper abdominal pain was 0.3%. Moreover, the frequency of FCA lower abdominal pain was 1.6%, whereas the frequency of FCA upper abdominal pain was 0.7%.

Our study includes 26 (2.6%) students with functional dyspepsia. The number of male students with FD was only five (0.5%) in contrast to the number of female students with FD of 21 (2.1%).

In our study, we evaluated IBS in two groups: those associated with lower abdominal pain and those associated with upper abdominal pain. Those associated with lower abdominal pain turned out to be 2.5%, while

those associated with upper abdominal pain were calculated at 1.9%. The total IBS rate was found to be 3.9%.

The prevalence of male students with IBS was 2.2% and the prevalence of female students with IBS was 1.7%.

The prevalence of functional abdominal pain syndrome (FAPS) was found to be 0.8%. The frequency of functional abdominal pain syndrome associated with lower abdominal pain was 0.6% and the frequency of functional abdominal pain syndrome associated with upper abdominal pain was 0.3%. While there were six (0.6%) male students with FAPS, there were two (0.2%) female students with FAPS.

The prevalence of functional abdominal pain (FAP) was found to be 2.2%. The frequency of functional abdominal pain associated with lower abdominal pain was recorded at 1.6% and functional abdominal pain syndrome associated with upper abdominal pain was 0.7%.

While there were 12 (1.2%) male students with FCA, there were 10 (1%) female students with FCA.

In our study, 48 students (4.8%) met all abdominal migraine criteria. While there were 11 (1.1%) male students with abdominal migraine, there were 37 (3.7%) female students with abdominal migraine.

In our study, there were a total of 93 students with Abdominal Pain Associated FGD. Among these students were those with multiple disorders. While there were a total of 45 (4.5%) male students with FGH, a total of 48 (4.8%) female students with FGH were identified.

A glance on the distribution of the students with FGD in our study suggests that 33.5% of the FGDs were abdominal migraine, 27.3% were IBS, 18.2% were FD, 15.4% were FAP and 5.6% were FAPS.

Table 8: Functional Gastrointestinal Disorders and Their Frequency

DISORDER	FREQUENCY %	N
Functional dyspepsia	2,6	26
IBS associated with upper abdominal pain	1,9	19
IBS associated with lower abdominal pain	2,5	25
IBS (Irritable Bowel Syndrome)	3,9	39
FAPS associated with upper abdominal pain	0,3	3
FAPS (lower abdominal pain associated)	0,6	6
FAPS (Functional Abdominal Pain Syndrome)	0,8	8
FAP associated with upper abdominal pain	0,7	7
FAP associated lower abdominal pain	1,6	16
FAP (Functional Abdominal Pain)	2,2	22
Abdominal migraine	4,8	48
FGD associated with abdominal pain	9,3	93

4. DISCUSSION

The age range of our study was set as 11-15 years, and there are a limited number of studies in the body of literature on FGD for this age group [4-7]. In our study, the incidence of FGD associated with abdominal pain was found to be 9.3% according to the Turkish Rome III scale. In studies conducted in similar age groups in the body of literature, rates of 12.5% [10], 13.8% [7] and 26.6% [19] were encountered. Although the age range is close to each other, the students form the study group, and the female/male ratio is the same, this difference between the studies is considered most likely to have resulted in from the differences in the level of development between countries. In studies conducted on cases referred to primary health institutions of 2nd and 3rd order in Norway and Poland, these rates turned out to be 87% and 36.58%, respectively [8-9]. Our consideration is that the high rate of cases referred to the hospital was due to the fact that these cases were patients who had already arrived at the health institution with a complaint. Similar to our study, a 2018 study using the Rome III criteria found a prevalence of 26.6% for Functional Gastrointestinal Disorders (FGIDs) in 7148 children aged 11-18 years in the Mediterranean Region of Europe. It is noteworthy that the study included children 3 years older. This is because older children may experience FGIDs differently than younger children.

In our study, the most common FGD we found in students were abdominal migraine (4.8%) and IBS (3.9%). The comparison of this rate with other studies in the body of literature suggests that is higher relevant to 1% [10] and 3% [13]. Different age groups, diagnostic criteria, and data collection methods may have prevented studies from producing similar results. Furthermore, in a study conducted in a secondary care hospital in Norway between 2006 and 2008, IBS (23%) was the most common, while abdominal migraine (23%) was found to be equally common [8]. This difference in the percentage of frequency between the studies is caused by fact that our study consisted of a community-based group that did not have any disorder, and the other study consisted of patients who arrived at with the complaint of recurrent abdominal pain in the second step. Contrary to other

studies, the reason why IBS is the second most common in our study is that there are different frequencies of IBS in different geographical regions, as suggested in the 2005 study [11]. In a study conducted among young students with an average age of 20 years in China, the prevalence of IBS was found to be 7.85% [6]. The age group in this study is higher than in our study, and the questionnaire used is different from ours. For these reasons, the prevalence of IBS may have occurred at a high frequency according to our study.

In a study conducted in 2005 among the cases who arrived at primary health care institutions in 32 different provinces of Turkey, the frequency was found to be 8.8% in the 15-25 age group used for the diagnosis of IBS according to the Rome-II criteria [12]. This study consists of people selected from among the people who went to see the doctor, and the age group is higher than our study. In addition, the criteria used in diagnosis are different from ours.

According to studies in the body of literature, abdominal migraine affects 1%-4% of children [13-14]. In pediatric gastroenterology clinics, diagnosis is made in 2.2%-5% of children using Rome II criteria [15-16]. In our study, there were only 11 male students compared to 37 female students with abdominal migraine. As previous studies have shown, we have detected abdominal migraine more frequently in girls than in boys.

In our study, abdominal migraine was the most common FGD (4.8%), followed by IBS (3.9%), FD (2.6%), FAP (2.2%) and FCS (0.8%). Abdominal migraine (1-5%), IBS (20-45%), and FD (14-47%) have been reported as FAP (0-8%) in previous studies [15-17]. In these studies, the fact that the population consisted of patients, that the patients were evaluated in the second step and diagnosed after being referred to the third step, and that they were evaluated according to the Rome II criteria may allow to explain the difference in these rates.

Only a few studies on functional dyspepsia (FD) in children and adolescents had been conducted using the Rome III criteria. In 2008, FD was reported as 21.4% in children with recurrent abdominal pain [18]. This rate, which is quite high according to our study, is on account of the fact that the cases were selected from children with recurrent abdominal pain.

In our study, FAP was 2.2% and FAPS were 0.8%. In 2011, in two separate studies by Devanarayana, the FAP was 3% [13] and 4.4% [16] was reported as. In these studies, all patients with FAP and FAPS were calculated as FAP. The similarity of the rates with our study is considered to stem from similarities between the studies such as age group, methods and criteria used, and the fact that the population consists of students.

As in our study, we did not find studies in the literature in which IBS, FAP and FAPS were categorized as lower and upper abdominal pain, and their frequencies were calculated separately. When similar studies are published on this subject in the coming years, we may have the opportunity to compare the results.

Consequently, our study has contributed to the body of literature on the prevalence of FGD associated with abdominal pain in the 10-15 age group in our country and will provide guidance for future studies.

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