

Research Article

Chronic Functional Constipation and Anxiety in Mothers and Children: Is there a Link?

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Abstract

Objective: To determine if mothers of children with chronic functional constipation show higher levels of anxiety than mothers of children not constipated.

Methods: Participants were recruited from patients at the Outpatient Pediatric Gastroenterology and Child Care Clinic of the Hospital das Clínicas at UFPE. Cases were considered children 8-12 years of age who complied with the Rome III criteria for chronic functional constipation. The control group had the same age but did not meet this requirement. We excluded patients with chronic diseases or other functional gastrointestinal disorders. Mothers applied the "Parent-report form for children", the constipation module of Rome III questionnaire for adults and the Beck Anxiety Inventory. With children, we used the Screen for Child Anxiety Related Emotional Disorders.

Results: The case group consisted of 57 children and adolescents and the comparative group of 82 children and their respective mothers. Children in the case group had more separation anxiety disorder than those in the comparison group ($p=0.006$). It was also observed that most constipated children's mothers often exhibit the same condition ($p=0.04$). However, constipated children's mothers did not show higher anxiety levels in comparison with the comparative group's mothers ($p = 0,46$)

Conclusions: Mothers of constipated children were not more anxious than those of children without functional constipation. Separation anxiety disorder was more frequent among the constipated children though. This shows the relevance of an approach that goes beyond food and drug orientation and evidences psychosocial aspects.

ABBREVIATIONS

CFC: Chronic Functional Constipation; SCARED: Screen for Child Anxiety Related Emotional Disorders; BAI: Beck Anxiety Inventory; DSM: Diagnostic and Statistical Manual of Mental Disorders; CCEB: Brazilian Economical Classification Criterion; UFPE: Universidade Federal de Pernambuco

INTRODUCTION

Chronic functional constipation (CFC) is a frequent diagnosis, corresponding to about 3% of events in Pediatric clinics and 25% in Pediatric Gastroenterology clinics [1]. According to the ROMA III criteria, the disorder does not come with anatomic, biochemical or inflammatory changes that justify the clinical condition. The etiology involves multiple factors. In some cases, a genetic predisposition can be identified and the importance of environmental factors is highlighted, such as the diet and

psychosocial stressors in its development [2].

Sexual abuse, parents' separation or the loss of a loved one are described as psychosocial stressors. In vulnerable children, they serve as a trigger, modulating the way of coping with and learning disease-related behaviors (gaining attention, absence from school, getting gifts, etc.) [3]. The psychosocial stressors are important because they are associated with the vicious circle characteristic of constipation: the child feels pain, gets afraid of evacuating, assumes retentive behavior and starts to eliminate hardened and painful feces [1,3,4]. In addition, high stress or anxiety levels may promote altered autonomous activity, which would influence the intestinal motility and/or sensitivity [5,6].

CFC frequently comes with high anxiety levels and this makes the patients and/or their caregivers perceive and interpret their symptoms as corresponding to a more severe condition, to a greater search for medical care and less therapeutic success [3,4].

Anxiety disorders, although very common in the general population (and in the pediatric age range, have been clearly identified as more frequent in people with functional gastrointestinal disorders when compared to healthy controls [7-9]. In addition, constitutional factors like inhibited behavior, and behavioral factors like the type of bond established with the parents or responsible caregivers were identified in the etiology of anxiety disorders [10,11].

Considering that, in both conditions (CFC and anxiety disorders), social and environmental conditions influence the etiology, and given the existing relation of comorbidity between them, one may suppose that mothers with moderate or severe anxiety levels face difficulties to cope with children suffering from defecation difficulties. This could perpetuate an initially self-limited condition of constipation [3]. By other hand, similarly to what happens to children with functional abdominal pain, children's constipation could increase mothers' anxiety (if they identify children's symptoms as signs of a severe disease) [3].

This study was aimed at verifying whether mother of constipated children report higher anxiety levels and if the frequency of anxiety disorders in their children is higher.

MATERIALS AND METHODS

The study was undertaken at the Pediatric Gastroenterology and Childcare outpatient clinics of the Hospital das Clínicas at Universidade Federal de Pernambuco (HC-UFPE), Brazil.

Children between eight and 12 years of age and their mothers were studied. The research received approval from the Institutional Review Board at the Center for Health Sciences of UFPE under number 0471.0.172.000-11. Cases were considered as children who attended to the Rome III criteria for chronic functional constipation (presence of at least two of the following parameters during at least two months in the pediatric group: two defecations or less per week; at least one episode of incontinence per week; history of excessive feces retention; history of painful intestinal movements; presence of large fecal mass in the rectum; history of large fecal diameter that can obstruct the toilet) [1]. The controls did not attend to these criteria. Patients with other functional gastrointestinal disorders or chronic conditions were excluded.

The cases were recruited in Pediatric Gastroenterology outpatient clinics of HC-UFPE. Controls were healthy children that came to the Childcare outpatient clinics for pediatric follow-up.

The Screen for Child Anxiety Related Emotional Disorders (SCARED) was applied to the children. It consists of 38 questions related to the current moment in the child's life, which can be scored between 0 and 2 and which permit the identification of anxiety disorders. These 38 items are divided in five factors that are similar to the classification of anxiety disorders in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV): panic/somatic, generalized anxiety, separation anxiety, social phobia and school phobia [12]. According to the authors, a total score over 25 indicates the presence of an anxiety disorders. The specific diagnoses for each of the anxiety disorders followed the recommendations of the

SCARED [12]. This test version had been previously validated for use in the Brazilian population [13].

Next, the Beck Anxiety Inventory (BAI)^c was applied to assess the mothers' anxiety level. The BAI consists of 21 items that relate to the interviewee's last week and that can be scored between 0 and 3. Based on the test results, the maternal anxiety level could be classified as minimal (0 to 10), mild (11 to 19), moderate (20 to 30) or severe (31 to 63) [14,15]. This test had been previously translated and validated for the Brazilian population [15]. To analyze the results, the BAI scores were grouped in two categories: minimal/mild and moderate/severe.

The form of the constipation module of the Rome III criterion was applied to the mothers to assess the presence of constipation and the Brazilian Economic Classification Criterion (CCEB) to estimate the participants' economic class (A1 till E). According to their score, the families could be classified as: A1: 42-46 points; A2: 35-41 points; B1: 29-34 points; B2: 23-28 points; C1: 18-22 points; C2: 14-17 points; D: 8-13 points; E: 0-7 points [16].

The questionnaires were filled in in the waiting room while the families waited for children's consults. The researcher presented the proposal of the study and asked the parents and their children if they wanted to make part of this. It was emphasized that this research had no relation with their clinical consultation and that they would not experience any kind of prejudice if they refused to be participants.

By other hand, that ones who accepted to be included in this study received general orientations about how to avoid constipation (including informations about diet, lifestyle and behavior). When any person presented chronic constipation or anxiety symptoms, he/she was sent to Pediatric Gastroenterology or Psychology Outpatient Clinic.

For the sake of statistical analysis, the quantitative variables were expressed using medians and quartiles and the qualitative variables using proportions. The frequency differences and the association among the qualitative variables were tested using the chi-square or Fischer's exact test. The differences of means were analyzed using the Mann-Whitney test. Statistical significance was set as < 0.05 .

RESULTS AND DISCUSSION

As regards the age, 65% (37/57) of the cases and 65% (53/82) of the controls were between 8 and 9 years of age ($p=0.88$). Concerning sex, 58% (33/57) of the cases and 59% (48/82) of the controls were male ($p=0.64$).

The median maternal age among the cases was 34 years (Q1-29; Q3 - 40), against 35.5 years among the controls (Q1 - 30; Q3 - 41) ($p=0.86$). What the economic class is concerned, 86% (49/57) of the cases' families and 80% (66/82) of the controls' families belonged to classes B and C ($p=0.64$).

It was verified that 26.3% (15/57) of the cases' mothers and 19.5% (16/82) of the controls' mothers demonstrated moderate or severe anxiety. This difference between the groups was not significant ($p=0.46$) (Figure 1).

The children with CFC demonstrated more separation anxiety disorder than children without this condition ($p=0.006$).

As regards somatic complaints/panic, generalized anxiety and social phobia, no statistical difference was found between the groups (Table 1).

As observed, 42.1% (24/57) of CFC children's mothers were constipated, while 24.4% (20/82) mothers of children without CFC presented constipation (p=0.04).

DISCUSSION

The mothers of children with CFC did not demonstrate higher anxiety levels than the mothers of children from the control group. Except for the separation anxiety disorder, the anxiety disorders were frequent in children from both groups. Anxiety is a complex phenomenon with different biopsychosocial determinants, present to a greater or lesser extent in all people, making it difficult to quantify the disorder in a punctual assessment. This fact is even recognized in the tool used, the BAI, which does not admit a situation of absence of anxiety [14,15].

On the other hand, manifestations of anxiety are intrinsically linked to each person's life history and to the environment (s) he circulates in. Mental Health studies indicate that, the more precarious the socioeconomic situation a person lives in, the more (s)he is subject to a mental disorder. That may not be surprising in view of the high prevalence of anxiety disorders in the general population [10,11].

In this context, the higher frequency of separation anxiety disorder found in the case group is important. As the groups are similar in terms of sociodemographic characteristics, one

may suppose that the result found is related to these children's constipation. Nevertheless, this study is unable to explain the relation between constipation and separation anxiety.

Studies involving children with recurring abdominal pain and irritable bladder syndrome found that these patients also exhibited higher anxiety levels [7-9,17]. One possible explanation is that constipation and anxiety similarly exhibit altered brain and autonomous activity, as well as conditioning by fear. That is actually one of the hypotheses raised to justify the high rate of comorbidities between the conditions [18]. A review on anxiety disorders describes that the prevalence of "any anxiety disorder" in the child and adolescent population corresponds to 15-20%. When separated per type, the most prevalent disorders are separation anxiety (2.8-8%), specific phobias (10%) and social phobia (7%) [11].

Based on the results found, however, the group of constipated children may be more susceptible to suffering from a separation anxiety disorder. Separation anxiety disorders tend to be related with difficulties to establish bonding in the first years of life and with the persistent fear of losing a loved one. Secondary to this, the children start to experience difficulties to cope with new situations (like school for example) and to explore the environment, due to fear that, while occupied in these activities, they might lose their mother or another significant person [19].

Another interesting point refers to school phobia (or school refusal), although that diagnosis is not part of the DSM-IV, it is a frequent symptoms and associated with many diagnoses

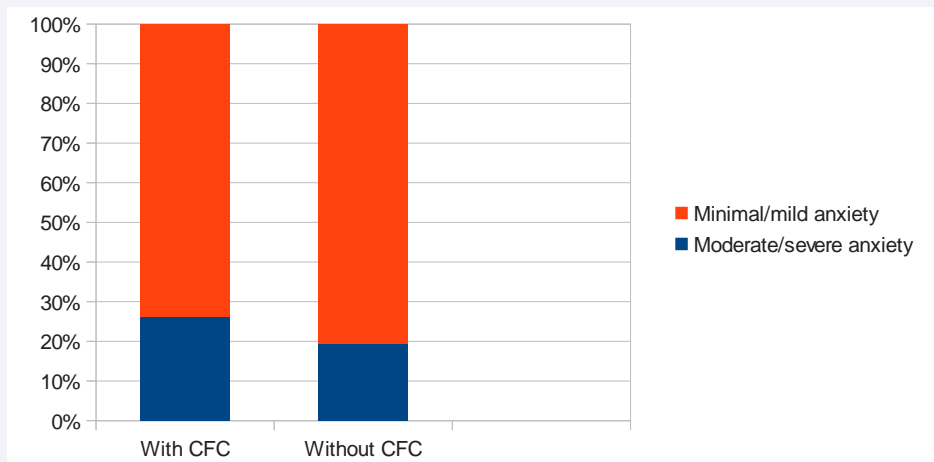


Figure 1 Anxiety level of mothers of children and adolescents with and without chronic functional constipation (p=0.46).

Table 1: Type of anxiety disorder in children from case and control groups.

Anxiety disorder	With CFC (%)	Without CFC (%)	p
Somatic/panic	7 (12.3%)	9 (11%)	0.97
Generalized anxiety	17 (29.8%)	24 (29.3%)	0.91
Separation anxiety	40 (70.2%)	37 (45.1%)	0.006
Social phobia	17 (29.8%)	24 (29.3%)	0.91
School phobia	27 (47.4%)	44 (53.7%)	0.57

Abbreviations: CFC: Chronic Functional Constipation

(such as separation anxiety disorder, generalized anxiety, social phobia and major depression). Two incidence peaks have been described: between 5 and 6 years of age and between 10 and 11 years of age, corresponding to the entry in school and the start of the sixth year of primary education [11,20,21]. As suggested, these age ranges correspond to moments of great change in the children's lives, as a result of the passage from family life or kindergarten to school life and the change from teaching by one teacher (generally female and therefore, associated with the mother figure) to teaching by different teachers.

In this research, the significance level for this disorder corresponded to 0.06. In case of a larger sample, a difference between the research groups could be found. In future research, this perspective would permit assessing the impact of chronic functional constipation in these young people's school and academic life or, on the other hand, a possible influence of academic life on these individuals' emotional status and intestinal habits.

Other authors found a prevalence rate of 36.1% for internalizing disorders (that is, anxious and mood disorders) among constipated children [7], as well as a higher prevalence of social fears, obsessions and compulsions, attention and activity problems and opponent behavior among children suffering from fecal escape [8]. A comparison between anxious and non-anxious children in terms of the presence of functional gastrointestinal disorders found a higher frequency in anxious children just for functional constipation [22].

Another study involving mothers of children with and without functional abdominal pain found a larger number of mothers with anxiety disorders and depression in the case group [17]. It could be conjectured whether this difference would be due to the fact that the study populations differed in terms of socioeconomic or genetic characteristics or because the explanatory model of functional abdominal pain differs from the CFC model.

Although there were no differences between the research groups in terms of maternal anxiety, the presence of constipation and anxiety in the mothers has been demonstrated in other studies. In one of the studies, it was verified that half of the investigated adults with irritable bowel syndrome presented mild anxiety [23]. Similarly, another population based study showed that adult patients with constipation presented higher depression and anxiety scores than healthy individuals. In the same study, women showed higher anxiety levels than men [24]. Due to the sample size and the research design, the sample could not be stratified and it could not be assessed whether the constipated mothers in the case and control groups present anxiety levels different from mothers without constipation. This perspective can be suggested for future studies.

The finding that children with CFC have mothers with the same disorder more frequently than in the control group, in turn, supports the results of other studies [25-27]. In one of these, the prevalence of functional gastrointestinal disorders in fathers of children with one of these disorders corresponded to 64.1% when compared to fathers of children without this condition. In the same study, 41% of the children with constipation also had mothers with this problem [25]. This fact may represent both

a vulnerability to constipation and learning by imitation of one of the parents with the same problem or the observation of the child's psychosocial gains (greater attention from fathers and absence from school) [4,21,27]. In addition, one might suppose that the family's shared diet contributes to the presence of the constipation symptom (that is, as another environmental influence).

One limitation in this study is the fact that the researchers worked exclusively with the mothers (it has been well acknowledged in the literature that, in adult age, the prevalence of constipation among women is higher). In subsequent research, the fathers of these children should also be investigated.

As regards the presence of anxiety in mothers and children, earlier studies have indicated that mothers of children with anxiety disorders tend to present higher anxiety levels [10,19,27,28]. What this type of disorder is concerned, a study indicated that higher maternal anxiety levels were positively correlated with higher levels of separation anxiety disorder symptoms in their children [11]. Other researchers found that children of mothers with anxiety disorder showed a higher risk of developing anxiety disorders [27] and that maternal phobic anxiety was associated with separation anxiety disorder and with total anxiety in the children [28].

Our study comes with the following limitations: the etiology of constipation in the mothers was not investigated, only the presence of the symptom; therefore, some mothers may have suffered from constipation due to organic causes. The children's diagnoses based on the SCARED could have been compared with the diagnoses of an experienced psychiatrist, which would have enhanced their reliability. Finally, the presence of anxiety in the research participants may not reflect the prevalence in the population because the study was undertaken at a university hospital and the cases with greater psychological comorbidity tended to seek specialized care in Gastroenterology more frequently.

CONCLUSION

In conclusion, this study demonstrated that mothers of children with chronic functional constipation are not more anxious; that children with CFC presented more separation anxiety disorders and had mothers suffering from constipation more frequently.

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