

# THE PSYCHOSOCIAL IMPACT OF CHRONIC ABDOMINAL PAIN IN FUNCTIONAL GASTROINTESTINAL DISORDERS FOR BOTH CHILDREN AND ADOLESCENTS – CLINICAL AND THERAPEUTIC APPROACHES

Anamaria Ciubara<sup>1</sup>, Roxana Chirita<sup>1</sup>, Gabriela Paduraru<sup>2</sup>, Dania Andreea Radu<sup>1</sup>,  
Claudia Adriana Olaru<sup>2</sup>, Ilinca Untu<sup>1</sup>, Lucian Stefan Burlea<sup>3</sup>

<sup>1</sup>*Socola Clinical Psychiatry Hospital,*

<sup>2</sup>*„Gr. T. Popa“ University of Medicine and Pharmacy, Iasi*

<sup>2</sup>*„Sf. Maria“ Clinical Pediatrics Hospital,*

<sup>2</sup>*„Gr. T. Popa“ University of Medicine and Pharmacy, Iasi*

<sup>3</sup>*„Gr. T. Popa“ University of Medicine and Pharmacy, Iasi*

## ABSTRACT

Both functional abdominal pain and irritable bowel syndrome are common causes of chronic abdominal pain in children and adolescents. Addressing these nosological entities is done according to the biopsychosocial model of functional gastrointestinal disorders, given their effect on quality of life and psychosocial status thereof. The cognitive-behavioral therapy, family psychotherapy, relaxation techniques or hypnotherapy have proved effective in achieving better coping mechanisms in alleviating psychological and somatic symptoms. However, antidepressant medication including selective serotonin reuptake inhibitors and tricyclic antidepressants, improve psychiatric symptomatology, especially depressive mood due to gastrointestinal illness, but also digestive symptoms due to mechanisms of action that depend on complex neurotransmitters.

**Keywords:** functional gastrointestinal disorders, pediatric population, biopsychosocial model, antidepressants, cognitive-behavioral therapy

## INTRODUCTION

Both functional abdominal pain and irritable bowel syndrome represent causes for chronic abdominal pain especially in the general pediatric population. It is estimated that 13-38% of children and adolescents experience weekly abdominal pain, and 24% of children show symptoms that persist for more than 8 weeks. For most patients there was no detectable cause responsible for inflammation, anatomical, metabolic or neoplastic process, being diagnosed with either irritable bowel syndrome or functional abdominal pain. Both entities are classified as functional gastrointestinal disorders characterized by gastrointestinal symptoms, of

chronic or recurrent nature, that can not be explained by structural abnormalities or biochemical imbalances. The diagnosis of these diseases is based on clinical criteria (signs and symptoms) (Table 1, Table 2) (1,2,4).

**TABLE 1.** Rome III diagnostic criteria for functional abdominal pain (1)

All the following criteria met at least once a week, for at least 2 months:

1. episodic or continuous abdominal pain
2. insufficient criteria for another functional disorder gastroenterological
3. no evidence of an inflammatory, anatomic, metabolic, or neoplastic process, explaining the symptoms

Corresponding author:

Ilinca Untu, „Gr. T. Popa“ University of Medicine and Pharmacy, 16 Universitatii Street, Iasi

**TABLE 2.** Rome III diagnostic criteria for irritable bowel syndrome (1)

The inclusion of both criteria, at least once a week, at least 2 months:
1 discomfort/abdominal pain associated with two or more of the following for at least 25% of the time: <ul style="list-style-type: none"> <li>• symptom relief after defecation</li> <li>• onset associated with a change in stool frequency</li> <li>• onset associated with a change to the shape/stool consistency</li> </ul>
2 no evidence of an inflammatory, anatomic, metabolic, or neoplastic process, explaining the symptoms

In addition to recurrent abdominal pain, children with irritable bowel syndrome experience bowel abnormalities with alternating stool frequency and consistency. It has been shown that even at children the irritable bowel syndrome classification remains valid – irritable bowel syndrome with diarrhea, irritable bowel syndrome with constipation and a mixture of those two, but there are no information obtained through prospective studies to determine their prevalence (4,5).

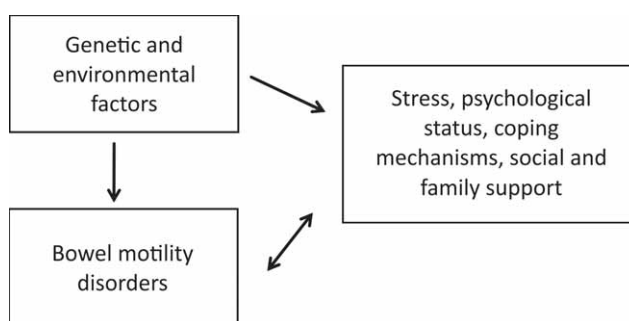
## BIOPSYCHOSOCIAL APPROACH

Chronic abdominal pain is associated with a reduction in overall functioning of the child and adolescent. Thus, there is a high rate of school absenteeism, use of medical services and a deterioration of family relations. Self-reported scores on quality of life are significantly lower in children with chronic abdominal pain caused by the two diseases mentioned above, as opposed to healthy children (1,3,6).

In the course of time, research into chronic abdominal pain in children and adolescents has come to develop a true biopsychosocial model of the disease, thus replacing the unilateral approach, which targeted only the biological component of the etiology. Consequently, the occurrence of functional gastrointestinal disorders are based on the joint action of genetic, physiological (intestinal motility) and psychological factors (especially stress factors) (Fig. 1). Despite sustained efforts to identify the origin and cause of this nosological categories, therapeutic management is limited by insufficient understanding of the pathophysiologic aspect that is still perfectible (1,14).

Both irritable bowel syndrome and functional abdominal pain in children and adolescents, require a complex and multidisciplinary therapeutic approach targeting pharmacological treatment, diet, psychosocial support and alternative therapies.

Once one of the two diagnoses is established, therapeutic approach is based on the biopsychoso-

**FIGURE 1.** The concept of functional gastrointestinal disorders (1.2)

cial model. It is advisable that the physician actively listens the patient and his family, encourages and gives an optimistic, but realistic perspective regarding treatment of the disease. The patient and his caregivers must be ensured that a diagnosis of irritable bowel syndrome or functional abdominal pain, does not represent a diagnostic failure of other disease. It must be explained that the effects of the treatment install gradually, thus establishing realistic therapeutic targets and aiming to adapt better to the potential symptoms by maintaining daily activities (3,5,6).

In terms of therapeutic interventions, the treating physician should consider the potential placebo effect. Numerous studies on functional gastrointestinal disorders and in particular irritable bowel syndrome and functional abdominal pain have shown that the failure of significant interventions were not due to the lack of improvement regarding symptoms, but to a strong placebo effect. One of the studies supporting this hypothesis was conducted by SAPS et al., where 58% of the placebo group showed an improvement in symptoms, compared with 63% of patients which took amitriptyline and reported an improvement (1,7).

Studies have shown notable benefits of establishing a positive patient-physician relationship, this being the foundation for a good therapeutic response in both functional abdominal pain and irritable bowel syndrome (10,11).

## PSYCHOSOCIAL INTERVENTIONS

Accepting and promoting the biopsychosocial model pioneered psychosocial interventions, including parental education, family therapy, cognitive behavioral techniques, relaxation techniques, hypnotherapy. Most of these strategies aim, in addition to the direct effect on somatic symptoms of the child and his skills to manage symptoms (1.2,9).

A series of meta-analyses have shown that psychological intervention confirmed its efficacy in treating symptoms, both adults and children (1,8).

The role of psychoeducation is to give important information regarding abdominal pain, but also its relationship with the psychological trigger factors, the patient's and his family. Family therapy aims first and foremost the positive interaction between family members, not focusing solely on the patient, in order to change maladaptive behaviors, to increase tolerance to symptoms and encourage the development of effective coping methods. It has been shown that parents' attention focused exclusively on the children's symptoms significantly increases their somatic complaints.

Cognitive behavioral therapy is the most common type of psychotherapy that appeals to the functional gastrointestinal disorders, based on a complex interaction between thoughts, feelings and behaviors. The main goals of cognitive-behavioral therapy is the development of more effective coping mechanisms and the improvement of problem-solving strategies, the detection of trigger factors and to reduce maladaptive reactions that they usually cause. Specific techniques may include keeping a diary of your symptoms with consecutive feelings, thoughts and behaviors, to adopt strategies for relaxation and fun, using positive and negative elements for behavioral changes and gradually, being able to successfully realize activities that the child or adolescent used to avoid because of gastrointestinal symptoms.

The American Academy of Pediatrics Subcommittee, which deals with issues of chronic abdominal pain, recently reached the conclusion that cognitive behavioral therapy may be helpful in improving symptoms of abdominal pain and dysfunctions. (1,2,3,20)

Relaxation techniques are generally used in combination with other psychosocial therapy in order to reduce psychological stress by achieving a physiological condition which is in contrast to the way in which the body responds to stress. There are a variety of methods, that can be used to decrease heart rate, to adjust respiration and blood pressure, to reduce muscle tension, and may even adjust the activity of the brain. For instance, abdominal breathing stimulates the parasympathetic nervous system in order to relax and achieve a state of calm. The progressive muscle relaxation helps children to flex and relax alternatively every muscle group of their body, then being able to focus on the feeling of relaxation that results after each muscle flex (1,3)

Guided imagery is a specific form of relaxation in which the patient is asked to imagine a perfect scene with a stress free experience. This can be

combined with other techniques of relaxation, thereby achieving a high responsiveness to positive suggestions and ideas (1).

Biofeedback turns to electronic equipment in combination with breath control and also relaxation or hypnotic techniques to generate visual or audible indicators for muscle tension, body temperature or anal sphincter control, allowing the child to have external validation of physiological changes (1,2,3).

## PHARMACOTHERAPY

Abdominal pain caused by functional gastrointestinal disorders are believed to be associated with abnormal perception of sensation or alteration of visceral motility. Targets include modulation of smooth muscle cells in the gastrointestinal tract, peripheral neurotransmitter receptors, marrow neurons and cortical areas responsible for pain perception. Specific medication therapy for depression and anxiety is indicated for the management of functional gastrointestinal disorders, due to its effect on the central nervous system and also the periphery (15,16).

Antidepressants are one of the most studied classes of drugs for the treatment of functional gastrointestinal disorders. It is believed that the action mechanism is based on the re-education of the pain perception, mood and sleep improvement, as well as modulating the digestive tract by using anticholinergic drugs. A recent review regarding relevant studies conducted in adults, have shown that antidepressants such as tricyclics and selective serotonin reuptake inhibitors have brought benefits regarding functional gastrointestinal disorders treatment. However, in recent years, the use of antidepressants in the pediatric population has been limited because of the occurrence of suicidal ideation and behavior. A recent meta-analysis has shown, however, that this suicidal behavior does not lead to a remarkable increase in suicidal risk itself (15,17,18,19).

Tricyclic antidepressants act on serotonergic and adrenergic pathways, but also have act on antimuscarinic and antihistamine receptors. Thus the anticholinergic effects that are exercised on the digestive tract in order to slow down intestinal transit, are beneficial for patients with irritable bowel syndrome that present diarrhea, but they also may worsen constipation. In addition, other important side effects may occur in the form of cardiac arrhythmias. The American Cardiology Association recommends evaluating potential QT lengthening

by conducting routine electrocardiograms. Two recent clinical trials have confirmed the efficacy of amitriptyline for the treatment of irritable bowel syndrome and functional abdominal pain (1,17,19).

Selective serotonin reuptake inhibitors (SSRIs) work by blocking the reuptake of 5-hydroxytryptamine, increasing its presynaptic concentrations. Besides modulating effects on mood and anxiety, SSRIs may improve gastrointestinal symptoms due to the significant role of serotonin on the digestive tract, 80% of its reserves are located in enterochromatofin cells. However, the exact role of serotonin at this stage is not completely understood, but it is involved in the modulation of visceral motility of the colon and abdominal pain (15,19).

## REFERENCES

1. **Chiou E., Nurko S.** Management of functional abdominal pain and irritable bowel syndrome in children and adolescents, *Expert Rev Gastroenterol Hepatol*. Author manuscript; available in PMC Apr 1, 2011, *Expert Rev Gastroenterol Hepatol*. Jun 2010; 4(3): 293-304.
2. **Drossman D.A., Creed F.H.** Psychosocial aspects of the functional gastrointestinal disorders, *Gut* 1999;45:1125-1130
3. **Brent M., Lobato D., LeLeiko N.** Psychological treatments for pediatric functional gastrointestinal disorders, *J Pediatr Gastroenterol Nutr*. 2009 Jan;48(1):13-21.
4. **Saps M., Seshadri R., Sztainberg M., Schaffer G., Marshall B.M., Di Lorenzo C.** A prospective school-based study of abdominal pain and other common somatic complaints in children. *J Pediatr*. 2009; 154(3):322-326.
5. **Longstreth G.F., Thompson W.G., Chey W.D., Houghton L.A., Mearin F., Spiller R.C.** *Functional bowel disorders*. *Gastroenterology*. 2006; 130(5):1480-1491.
6. **Youssef N.N., Murphy T.G., Langseder A.L., Rosh J.R.** Quality of life for children with functional abdominal pain: a comparison study of patients' and parents' perceptions. *Pediatrics*. 2006; 117(1):54-59.
7. **Saps M., Youssef N., Miranda A., et al.** Multicenter, randomized, placebo-controlled trial of amitriptyline in children with functional gastrointestinal disorders. *Gastroenterology*. 2009; 137(4):1261-1269.
8. **Lackner J.M., Mesmer C., Morley S., Dowzer C., Hamilton S.** Psychological treatments for irritable bowel syndrome: a systematic review and meta-analysis. *J Consult Clin Psychol*. 2004; 72(6):1100-1113.
9. **Huertas-Ceballos A., Logan S., Bennett C., Macarthur C.** Psychosocial interventions for recurrent abdominal pain (RAP) and irritable bowel syndrome (IBS) in childhood. *Cochrane Database Syst Rev*. 2008;1:CD003014.
10. **Brent M., Lobato D., LeLeiko N.** Psychological treatments for pediatric functional gastrointestinal disorders. *J Pediatr Gastroenterol Nutr*. 2009; 48(1):13-21.
11. **Walker L.S., Williams S.E., Smith C.A.** Parent attention versus distraction: impact on symptom complaints by children with and without chronic functional abdominal pain. *Pain*. 2006; 122(1-2):43-52.
12. American Academy of Pediatrics Subcommittee on Chronic Abdominal Pain. Chronic abdominal pain in children. *Pediatrics*. 2005; 115(3):812-815.
13. **Ditto B., Eclache M., Goldman N.** Short-term autonomic and cardiovascular effects of mindfulness body scan meditation. *Ann Behav Med*. 2006; 32(3):227-234
14. **Day A.S.** Use of complementary and alternative therapies and probiotic agents by children attending gastroenterology outpatient clinics. *J Paediatr Child Health*. 2002; 38(4):343-346.
15. **Ford A.C., Talley N.J., Schoenfeld P.S., Quigley E.M., Moayyedi P.** Efficacy of antidepressants and psychological therapies in irritable bowel syndrome: systematic review and meta-analysis. *Gut*. 2009; 58(3):367-378.
16. **Bridge J.A., Iyengar S., Salary C.B., et al.** Clinical response and risk for reported suicidal ideation and suicide attempts in pediatric antidepressant treatment: a meta-analysis of randomized controlled trials. *JAMA*. 2007; 297(15):1683-1696.
17. **Gutgesell H., Atkins D., Barst R., et al.** Cardiovascular monitoring of children and adolescents receiving psychotropic drugs: a statement for healthcare professionals from the Committee on Congenital Cardiac Defects, Council on Cardiovascular Disease in the Young, American Heart Association. *Circulation*. 1999;99(7):979-982.
18. **Bahar R.J., Collins B.S., Steinmetz B., Ament M.E.** Double-blind placebo-controlled trial of amitriptyline for the treatment of irritable bowel syndrome in adolescents. *J Pediatr*. 2008; 152(5):685-689.
19. **Campo J., Perel J., Lucas A., et al.** Citalopram treatment of pediatric recurrent abdominal pain and comorbid internalizing disorders: an exploratory study. *J Am Acad Child Adolesc Psychiatry*. 2004; 43(10):1234-1242.
20. **Bursch B.** Psychological/cognitive behavioral treatment of childhood functional abdominal pain and irritable bowel syndrome. *J Pediatr Gastroenterol Nutr*. 2008; 47(5):706-707.

## CONCLUSIONS

The diagnosis of functional abdominal pain and irritable bowel syndrome in children and adolescents is based on signs and symptoms and should take into account the biopsychosocial model of functional gastrointestinal disorders. The development of a positive therapeutic relationship between doctor and patient / family is crucial. Multidisciplinary management of functional abdominal pain aims at balancing physical condition and the social status of the patient. Nevertheless, it remains a generous field of study, with results still not perfect.