REVIEW ARTICLE

Progressive Muscle Relaxation as treatment option for Children/Adolescents with Functional Gastrointestinal Disorders

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Abstract

Background:Functional gastrointestinal disorders are very common among children/adolescents.They are defined as a variable combination of chronic or recurrent gastrointestinal symptoms, not explained by structural or biochemical abnormalities. Abdominal pain is the prevalent symptom of all these conditions. Stress plays an important role in the pathogenesis of these disorders. Traditional medical treatment is not always effective, has various adverse effects and high cost.

Aim:Aim of this article was to provide information about the current knowledge of the pathophysiology of functional gastrointestinal disorders and the brain-gut axis and to inform about the use of progressive muscle relaxation as treatment option for the management of abdominal pain.

Method and Material: An introduction of the new evidence based alternative and complementary therapies such as progressive muscle relaxation that are effective in ameliorating suffering and abdominal pain.

Results: Progressive Muscle Relaxation is an evidenced based technique that reduces stress and pain. Usually it is part of the therapeutic package of mind body medicine. It is a simple, non invasive therapy with potential benefits for treating pediatric abdominal pain. It can be taught easily to patients and can be used anytime, anywhere. It can be applied from paraprofessional and reduces medical expenses.

Conclusions: Progressive muscle relaxation offers a treatment option for chronic abdominal pain in children/adolescents.Large scale randomized control studies are needed in order to provide sufficient evidence for the effectiveness of progressive muscle relaxation for pediatric chronic abdominal pain.

Keywords: Functional Gastrointestinal disorders, pediatric functional abdominal pain, progressive muscle relaxation

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Introduction

Chronic pain in children and adolescents varies from 15% to 30%, with prevalence increasing with age and occurring more commonly in female sex[1].Perquin et al[2] in a large representative sample of school children found that chronic or recurrent pain of three months or longer, was reported by 25% of the sample . Common chronic pain conditions for children and adolescents are the Functional Gastrointestinal Disorders which include Functional Dyspepsia, Irritable Bowel Syndrome, Abdominal Migraine, Functional Abdominal Pain and Childhood Functional Abdominal Syndrome. [3,4]The diagnostic criteria of these disorders became known as the Rome

criteria, because Rome was the city that the working team met. There is no medical test that confirms these disorders. The diagnosis depends on symptom based criteria (table 1). Functional gastrointestinal disorders (FGIDs) are defined as a variable combination of chronic or recurrent gastrointestinal symptoms and the symptoms aren't explained by structural or biochemical abnormalities.

Functional Gastrointestinal Disorders are common disorders among children and adolescents. They represent 2 % to 4% of all the pediatric office visits.[5] It is estimated that 6% of middle age students and 14% of high school students have Irritable Bowel Disorder. [6] Approximately 38% of school children complain of abdominal pain /weekly and this pain is of functional origin.[7] Abdominal pain is a common symptom of Functional Gastrointestinal Disorders and usually is chronic and recurrent. Approximately 25 % to 66% of these children continues to experience symptoms even in adulthood.[8] The quality of life of the patients is worse than their peers, they have higher prevalence of socialization problems, have high school absenteeism, higher anxiety and depression scores and use the health services and medications as adults .[9,10] Despite the high prevalence and morbidity of Functional Gastrointestinal Disorders therapeutic options are limited. The past ten years complementary and alternative medicine interventions have been used for the treatment of these disorders. Progressive muscle relaxation is one of them. This article will review the current knowledge of the pathophysiology of functional gastrointestinal disorder and the use of progressive muscle relaxation as treatment option.

Pathophysiology of Functional Gastrointestinal Disorders. The Brain - Gut Axis.

Functional Gastrointestinal Disorders are heterogeneous. Abnormal but not pathological functioning of the gastrointestinal tract causes the symptoms such as poor gastric motility, hypersensitivity to normal gut processes (hyperalgesia),impaired gastric relaxation, visceral hypersensitivity(lower threshold to pain) etc.[11]The term hyperalgesia means that pain sensations are caused by stimulus that normally don't cause pain. Patients with functional gastrointestinal disorders may have an abnormal reaction to various stimuli affecting gut such as meals, hormonal changes, psychological stressors etc [11] and these stimuli may cause pain.

It is thought that key role to the pathogenesis of these disorders plays the dysregulation of the communication between Enteric Nervous System and Central Nervous System. Enteric Nervous system (also called «little brain in the gut») plays an important role in the physiologic gut functions such as secretion, motility, release of hormones and neuropeptides.[12]The gastrointestinal tract is connected to the brain and both painful and non-painful stimuli are encoded to the brain. Brain communicates with the gut through pathways including Autonomic Nervous System, the HPA axis, immune and endocrine mechanisms which are termed as Brain – Gut axis. In the gut the parasympathetic system is thought to mediate non noxious sensations such as local reflexes, whereas sympathetic system mediates noxious sensations.[13] Exposure to stress may dysregulate the Brain – Gut axis in various ways.CRF, which is released when HPA axis is activated , has a potent act on gut. It modulates inflammation, increases gut permeability, increases perception to pain (hypersensitivity), modifies the bacteria flora and modulates gut mobility. [13] Nor-epinephrine which is also released when HPA axis is activated, increases the virulence of some bacteria. Changes in cytokines affect directly or indirectly the microbiota of the gastrointestinal tract. Other researchers have found that stress affects the Brain – Gut axis via modulation of a number of neuropeptides (such as CGRP) involved in gastric secretion and gastric mucosa. It is proved that Brain- Gut axis functions

bidirectionally and this bidirectional contact is kept by gut bacteria.[12,14] Stress modifies bacteria flora but also gut bacteria modulate motility, permeability and visceral sensitivity. This is caused by different mechanisms, via direct interactions with mucosal cells, via immune cells and via neural endings.

The important role of stress in the pathogenesis of functional gastrointestinal disorders is a basic conclusion of many researchers. Konturek et al.,[12] considers stress, especially chronic stress, as a major risk factor for the pathogenesis of functional gastrointestinal disorders and others diseases of gastrointestinal tract.

Progressive muscle relaxation as a treatment option.

The functional gastrointestinal disorders are common pain conditions, mostly abdominal pain conditions. Pain symptoms can be severe, disabling and have various adverse impact on the child and his family. Therefore effective treatment is important. Medical treatment consists of diet, antispasmodics, antidepressant, probiotics [15] etc. Neither one of these is optimal or effective in treating the disorder. The last ten years complementary and alternative medicine has been used for pediatric chronic pain. Treatments such as progressive muscle relaxation are advised to be offered to pediatric patients with headache as a matter of routine.[16] Mind Body Therapies such as breathing , relaxation, biofeedback, guided imagery provide a useful tool for the relief of the pain.[17]

One of the evidenced based stress management techniques is progressive muscle relaxation. [18] This is a technique of reducing stress by alternately tensing and relaxing muscles. Since 1944 when was developed, it has had a widespread application. Progressive muscle relaxation is effective for reducing pain and tension associated with pain in adults. It also decreases anxiety, discomfort and increases body awareness.[17,18] Evidence shows that it decreases the salivary cortisol and plays a role in immunoenhancement.[18,19] Progressive Muscle Relaxation is easily learned, reduces stress but also boosts some very important psychological attitudes such as self – control and sense of well being. [20]

Because functional gastrointestinal symptoms are associated with psychosocial factors complementary and alternative techniques have been tested and the results have been positive. Specifically hypnotherapy [21] and guided imagery techniques[22-24] are effective for abdominal pain in pediatric populations. Progressive muscle relaxation is always a part of the therapeutic package. In all these studies children experienced a significant decrease in pain.

Progressive Muscle Relaxation is a simple non invasive therapy with potential benefits for treating pediatric abdominal pain. It can be taught easily to patients because it is a simple technique. Once learned can be used on their own, anytime, anywhere in order to reduce their reactions to stressful situations and to calm themselves from pain. It can be applied from paraprofessionals. This self-regulation is a great boost to self esteem and is a lifelong skill. Progressive Muscle Relaxation should be applied to every children/adolescent with functional gastrointestinal disorders even if other forms of the therapeutic package aren't available. Surprisingly it is unavailable for pediatric abdominal pain. This is due to the lack of trained therapists and the reluctant of using it from the physicians.

Conclusion

Functional gastrointestinal disorders are common, chronic conditions. Abdominal pain is a primary symptom of all these disorders. Traditional

medical treatment is not always effective in treating and ameliorating suffering from pain and have various adverse reactions. On the other hand, pediatric pain is often misunderstood and undertreated. Children/ adolescents are human beings capable of experiencing pain. Reference to a child psychologist or child/adolescent psychiatrist for the pain symptoms causes anger or is met with defensiveness. Since functional gastrointestinal disorders are multifactorial the patients should be treated in the context of a biopsychosocial model. The use of alternative and complementary therapies should be a matter of routine care. Progressive Muscle Relaxation may be useful in ameliorating pain symptoms. Research on mind and body therapies for pediatric chronic abdominal pain should continue. Large scale randomized control studies are needed in order to provide sufficient evidence for the effectiveness of mind body techniques for pediatric chronic pain.

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ANNEX

Table 1. Diagnostic Criteria for Functional Gastrointestinal Disorders[4]

Diagnostic criteria for childhood functional abdominal pain
Must include all of the following criteria, fulfilled at least once per week for at least 2 months prior to diagnosis:
1.Episodic or continuous abdominal pain
2.Insufficient criteria for other functional gastrointestinal disorders
3.No evidence of an inflammatory, anatomic, metabolic or neoplastic process that explains the subject's symptoms
Diagnostic criteria for childhood irritable bowel syndrome
Must include both of the following criteria, fulfilled at least once per week for at least 2 months prior to diagnosis:
1Abdominal discomfort or pain associated with two or more of the following at least 25% of the time:
2.Improvement with defecation
3.Onset associated with a change in frequency of stool
4.Onset associated with a change in the form (appearance) of stool
5.No evidence of an inflammatory, anatomic, metabolic or neoplastic process that explains the subject's symptoms
Diagnostic Criteria for Abdominal Migraine
Must include all of the following , fulfilled at least once per week for at least 2 months prior to diagnosis
1. Paroxysmal episodes of intense, acute periumbilical pain that lasts for 1 hour or more
2. Intervening periods of usual health lasting weeks to months
3. The pain interferes with normal activities
4. The pain is associated with 2 or more of the following:
a. Anorexia b. Nausea c. Vomiting d. Headache e. Photophobia f. Pallor
5. No evidence of an inflammatory, anatomic, metabolic, or neoplastic process considered
Diagnostic Criteria* for Functional Dyspepsia
Must include all of the following , fulfilled at least once per week for at least 2 months prior to diagnosis
1. Persistent or recurrent pain or discomfort centered in the upper abdomen (above the umbilicus)
2. Not relieved by defecation or associated with the onset of a change in stool frequency or
stool form (ie, not IBS)
3. No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains
the subject's symptoms