Complementary, Holistic, and Integrative Medicine: Recurrent Abdominal Pain

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Introduction
Recurrent or chronic abdominal pain is a common and often perplexing condition, affecting between 15% and 35% of the pediatric population worldwide. Apley (1) first defined recurrent abdominal pain (RAP) in 1958 as at least three episodes of abdominal pain sufficient to disrupt a child’s daily activities over the previous 3 months.

At the time of Apley’s study, only 5% of cases were found to have an organic cause. With newer diagnostic methods, up to one third of cases of RAP may be found to have organic causes. “Red flags” that might indicate specific organic diseases are: a family history of inflammatory bowel disease, fever, weight loss, night awakening, anemia, bloody stools, and localized tenderness.

Most children who do not have specific organic disorders have functional RAP. The causes of functional abdominal pain still are poorly understood but are believed to be due to autonomic dysfunction or visceral hypersensitivity to stimuli such as intestinal bowel gas, an acute trigger such as a viral gastroenteritis, an increased central perception of pain, and altered bowel habits such as constipation. Perception of pain is mediated by temperamental, cultural, and psychological factors, such as anxiety or depression, and social stressors, such as learning difficulties and family stress.

Functional abdominal pain may be categorized into four specific disorders, as described by the Rome III criteria for functional gastrointestinal (GI) disorders: functional dyspepsia, functional abdominal pain, irritable bowel syndrome (IBS), and abdominal migraine. Postprandial abdominal pain, with feelings of bloating, gas, or heartburn, is classified as dyspepsia and may be associated with gastroesophageal reflux. IBS is characterized by cramping pain with alteration in bowel movements. Episodic abdominal pain associated with headache and pallor may be an abdominal migraine.

As with other illnesses, especially chronic conditions such as RAP, patients and families increasingly are turning to complementary and alternative medicine (CAM). In a group of 749 children visiting pediatric gastroenterology clinics in the Netherlands, 60% were found to have used CAM therapies. (2) Lack of effectiveness and incidence of adverse effects with standard medical therapy, along with school absenteeism, were the major reasons given for the use of such therapies. This article reviews the evidence-based CAM treatments for recurrent functional abdominal pain in children.

Biobehavioral Methods
Not surprisingly for a condition that involves the mind-body connection to such an extent, biobehavioral methods are the most effective evidence-based treatments for functional abdominal pain. It is important that families and children are educated about the importance of the mind-body connection. Parents and caregivers should be reassured that the pain is real, but it should be reframed in the context of a heightened sensitivity to normal stomach and bowel functions. Parents should not question children about their pain and should give them extra attention for nonpain behavior. It is important not to undertake unnecessary laboratory tests, procedures, and surgery. It is vital that children be taught to continue school and other normal activities, even before they are “cured.”

In 2003, Weydert and associates (3) systematically reviewed 57 studies of children who had functional abdominal pain and found that psychological interventions such as cognitive behavioral therapy (CBT) and hypnosis had the greatest efficacy. Since then, others

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NOTE: The agents discussed in this series are designated as dietary supplements rather than drugs. Although dietary supplements are regulated by the United States Food and Drug Administration (FDA), their manufacturers may make claims with little evidence and need not prove safety prior to marketing. The burden is on the FDA to monitor safety after the product is on the market. Readers are referred to the 1994 Dietary Supplement Health and Education Act (www.cfsan.fda.gov/~dms/detsupp.html).
have found that although few good controlled trials have been performed, the best evidence supports behavioral treatment. (4)(5)(6)

A number of randomized, controlled studies have shown the effectiveness of CBT for RAP. In these studies, children and caregivers were taught to reframe the perception of pain; establish contingency plans for management of pain; reward well behavior and ignore pain behavior; and use positive self-talk, relaxation, and imagination skills.

Sanders and colleagues (7) found that 56% of children who received CBT were pain-free according to a pain diary, and 70% were pain-free 6 months after intervention, based on parental observation. By comparison, only 24% and 38%, respectively, were pain-free in the control group. Humphreys and Gevirtz (8) found that in groups of children taught biofeedback or CBT, 72% were pain-free after intervention. Robins and coworkers (9) found a decrease of 25% in abdominal pain index scores immediately and 6 and 12 months after intervention with CBT and a 30% decrease in school absences compared with controls. Duarte and associates (10) found that the median number of pain episodes per month decreased from 15 to 2 in the CBT group after the fourth monthly session and decreased from 12 to 8 in the control group in the same period of time.

Hypnosis and biofeedback have been found to be very effective for the amelioration of suffering and pain in headaches and a variety of chronic pain syndromes. Hypnosis has been found to alter functional magnetic resonance imaging signal densities in the anterior cingulate gyrus and other regions of the brain, where abdominal pain is perceived and modulated. Hypnotherapy includes many of the same principles and techniques used in CBT: an explanation of the physiology of pain, an emphasis on nonpain behavior (favorite activities), relaxation, and mental imagery. However, hypnosis also includes specific suggestions for the relief of pain and continuation of normal activities.

Ball and associates (11) taught relaxation mental imagery techniques to a small group of children, who experienced a 67% overall decrease in dyspepsia-like pain, as measured by the Faces scale. Others adapted the “gut-directed” hypnotherapy developed in England (12) and in North Carolina (13) for adults who had IBS. Vlieger and colleagues (14) found that developmentally appropriate gut-directed hypnotherapy, used in six 50-minute sessions with children ages 8 to 18 years, resulted in 85% remission of symptoms at 1 year compared with 25% remission in symptoms for those in a control group receiving standard medical therapy.

In an intriguing recent study, van Tilburg and coworkers (15) employed home-based guided imagery recordings regularly in a group of children ages 6 to 15 years who had functional abdominal pain. A total of 63% in the treatment group responded favorably to this therapy compared with only 27% in a control group receiving medicine only. When the control group practiced home-based guided imagery, 62% were treatment responders.

Biofeedback combines relaxation and mental imagery with visual or auditory feedback of somatic changes (skin temperature, skin resistance, or heart rate variability). Biofeedback may be especially useful in modulating the autonomic reactivity found in many patients experiencing functional abdominal pain, as measured by rectal manometry. Humphreys and Gevirtz (8) used simple thermal regulation techniques, in which patients are taught to alter the skin temperature in their fingertips.

**Diet and Natural Health Products**

Interventions involving dietary manipulations, including increased fiber, lactose elimination, and supplements such as peppermint oil, have met with variable success.

Although lactose intolerance is common among adults of specific ethnic groups and nationalities, it is fairly rare among children. In a 1981 study, researchers found that a lactose-free diet did not result in significant change in abdominal pain symptoms, even among children who were shown to be lactose-intolerant on breath hydrogen testing. (16)

In 2001, Kline and associates (17) published their findings of a randomized, controlled study of 50 children who had RAP. The children in the treatment group received one to two enteric-coated capsules containing 187 mg of peppermint oil three times a day for 2 weeks. Results showed that 76% of treated children had a decrease in severity of symptoms compared with 19% receiving a placebo. Enteric-coated peppermint is believed to inhibit smooth muscle contractions in the gut. It also has a mild topical anesthetic effect.

The salutary effects of dietary fiber on the gut are well known. The highly refined and processed foods that make up much of the American diet contribute to the increase in constipation and obesity in American children. Caffeine, fatty or spicy foods, or carbonated beverages may trigger abdominal pain. However, the therapeutic effect of increased fiber alone on amelioration of pain symptoms is questionable.

Feldman and colleagues (18) reported a 50% reduction in abdominal pain among children receiving 10 g of insoluble fiber in cookie form compared with a 27% reduction in the placebo group. However, these results...
did not achieve statistical significance. In a similar controlled study that used larger amounts of fiber, Christensen (19) found no difference between treatment and control groups. Humphreys and Gevirtz (8) used a group that received fiber supplementation as a control in comparison with their “active intervention” groups who received behavioral treatments. Only 7% of children who received fiber alone were pain-free after treatment.

Because patients who have IBS, which encompasses a large percentage of children who experience RAP, have been shown to have decreased heterogeneity of their fecal flora compared with healthy individuals, probiotics such as Lactobacillus and Bifidobacterium have been used to alter the ecosystem of the gut therapeutically. These bacteria help to maintain a healthy intestinal mucosal barrier and prevent bacterial overgrowth. Probiotics also may decrease visceral hypersensitivity through an anti-inflammatory effect. Probiotics have been found to be useful in adults who have traveler’s diarrhea and children who have acute gastroenteritis. Whorwell and associates (20) found that the probiotic Bifidobacterium infantis 35624, administered in encapsulated form, in a specific dose of $1 \times 10^8$ colony-forming units, significantly reduced symptoms in a large group of adult patients who had IBS.

The effectiveness of probiotics in the treatment of RAP in children is mixed. Bausserman and Michail, (21) in a randomized, controlled study, found no difference in severity of pain or symptoms of bowel irregularity in a group of children receiving a Lactobacillus GG capsule compared with a placebo group, although the treatment group did have slightly reduced feelings of abdominal distention.

A smaller observational study involving children who had abdominal pain caused by constipation and were given a capsule containing Lactobacillus and Bifidobacterium found an increase of bowel movement frequency from 2 each week to 4.2 each week and a 50% decrease in pain. (22) However, these children also had enopresis and received enemas for 3 days as part of their treatment. Gawronska and coworkers (23) reported no overall differences in improvement of pain between placebo and Lactobacillus treatment groups in a study of 48 children, although 25% in the treatment group reported “no pain” at the end of the study, compared with 10% in the placebo control group.

Part of the reason for the mixed results of the effectiveness of probiotics in the literature may be the relationship of effectiveness with the specific strain of bacteria, the precise dose, and the vehicle that delivers the probiotic. Whorwell’s group found that the Bifidobacterium administered at either smaller ($1 \times 10^6$) or larger ($1 \times 10^{10}$) doses than the therapeutic dose ($1 \times 10^8$) were no more effective than placebo. (20)

Seventy-five studies of Chinese herbs or Ayurvedic remedies for IBS in adults are reported in the literature, three of which are double-blind randomized, controlled trials, (24) but no studies report the use of these herbs in children who have RAP. Some studies show the efficacy of chamomile and fennel in infants who demonstrate symptoms of colic. These herbs, along with ginger, have long been used to help with GI disorders in many cultures.

One observational study (25) compared a homeopathic remedy, spasmorel, to the antispasmodic hyoscine butyl bromide, a medication commonly used to treat functional abdominal pain. Both medications had similar effects on scores of a symptom scale.

**Physical Methods**

Six randomized, controlled trials have shown variable results for acupuncture as a treatment for IBS in adults, (26) but the literature contains no studies of acupuncture or any other physical treatment on children who have RAP.

**References**

Summary

- A comprehensive review of the scientific literature reveals little evidence for the effectiveness of any specific herbal or nutritional product or the use of supplemental fiber for the treatment of RAP.
- Although not the subject of this article, it should be mentioned that no evidence exists for the efficacy of any pharmaceutical product for RAP either, other than famotidine for treating dyspepsia (one small randomized, controlled trial) and pizotifen for the small subclass of children who suffer abdominal migraines (a smaller randomized, controlled trial).
- There is no evidence in the literature for the effectiveness of any physical manipulations or methods in treating RAP in children.
- Evidence is growing that supports the use of biobehavioral methods for the treatment of RAP. The most validated techniques are CBT and hypnotherapy, which is not surprising because RAP usually is functional. Functional refers to the cause not being organic, but rather due to a complex process that includes mind and body such as central sensitivity to pain, visceral hypersensitivity, autonomic dysfunction, and other factors still to be discovered. Mind–body or behavioral techniques help children return to normal daily activities, reinterpret their pain to lessen their suffering, and improve feelings of efficacy and self-worth. Specifically, guided imagery and hypnosis have been found to be highly effective in the treatment of nonorganic abdominal pain in children.
- Much more research, perhaps combining biobehavioral techniques with other traditional and complementary/integrative methods, needs to be conducted for this common and often perplexing pediatric disorder.

References
