

Recurrent Abdominal Pain in Children: Is Constipation an Issue?

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Chronic, recurrent abdominal pain is one of the most commonly encountered symptoms in children. The definition by Apley [1], as described in his pioneering studies, has largely remained: three or more recurrent episodes of abdominal pain severe enough to interfere with the child's normal activities persisting for more than 3 months occurring between the ages of 4 and 16 years of age. Chronic abdominal pain has been reported to occur in 10–15% of children.

Symptom-based diagnostic criteria have been established for the classification of functional gastrointestinal disorders in children – The Pediatric Rome criteria [2]. This classification system sub-categorizes functional disorders in terms of symptom constellation in the absence of structural or biochemical abnormalities: a) isolated paroxysmal abdominal pain; b) abdominal pain associated with dyspepsia-like symptoms including pain associated with eating, early satiety, regurgitation and nausea; c) abdominal pain associated with altered bowel pattern including diarrhea, constipation, or a sense of incomplete evacuation of stool; and d) abdominal migraine. In a recent study, Walker et al. [3] successfully sub-classified a group of children according to these criteria, which may form a basis for additional research demonstrating specific etiologic factors for each subgroup; this could lead the way towards subgroup-specific treatments.

The etiology and pathogenesis of recurrent abdominal pain in childhood is unknown, but there is consensus that the pathogenesis involves the interrelationship between altered gastrointestinal motility and visceral hypersensitivity. In a child with visceral hypersensitivity, painful sensations may be provoked by physiologic phenomena with or without accompanying life events. Examples of physiologic phenomena that may trigger pain include gastric emptying, intestinal contractions, or simple constipation. There appears to be a genetic component since there is a high frequency of pain complaints in family members. However, the morbidity associated with this condition is not physical but results from the interruption of normal activities like school attendance and family activities.

There are no evidence-based data for diagnosis, but the key to a positive diagnosis is a normal physical examination and the absence of 'alarm signals', which are involuntary weight loss, vomiting, diarrhea, gastrointestinal blood loss, fever, rash, arthritis, or a first-degree relative with inflammatory bowel disease. Minimal but focused laboratory testing is often required for reassurance.

The management of all types of chronic abdominal pain begins with making a positive diagnosis and explanation to the confused

child and parents. This involves a frank discussion with the family, informing them that the child's complaints are indeed real but that there is no serious pathology causing the symptoms. Specific treatments may include dietary modification, drugs and psychosocial support. In adult studies, there is an increasing body of evidence that possible initiating factors for autonomic nervous system dysfunction may be found in the central nervous system, namely the thalamus and limbic system. Furthermore, there is increasing evidence that serotonin and its receptors may play a role in functional abdominal pain [4].

The definition of constipation is quite variable. For some patients it may manifest as large or painful stools, infrequent or hard stools. Most childhood constipation results from intentional or subconscious withholding of stool. In children, a retentive pattern may be triggered by situations that cause stooling to be inconvenient, such as unpleasant toilet facilities in school. A vicious cycle develops, as retention causes increasing volumes of stool with more painful defecation that may lead eventually to encopresis and soiling.

However, in many children longer intervals between bowel movement, namely obstipation, may be the only complaint. As pointed out in the article by Eidlitz-Markus et al. [5] in this issue of the journal, this symptom may be initially missed or even ignored. It may not even be the primary physician's fault because the child may consider passing stool every 3 days as "normal." These authors [5] have shown that there is no substitute for thorough and direct questioning related to details of defecation, including how many stools a week the child passes. The vague question "do you have constipation?" is worthless. A thorough clinical assessment is all that is needed in most cases of constipation and will identify most patients with an organic cause for constipation. A rectal examination is essential and will usually reveal ampullar dilatation filled with hard stool to the anal verge. A plain abdominal X-ray is rarely required. For most children with chronic constipation, a treatment strategy based on a clean-out followed by maintenance therapy is required. Older children may respond well to increased fluid intake, sorbitol-containing fruit juices and increased fiber intake. Mineral oil has been the traditional maintenance treatment. New treatments include electrolyte-free polyethylene glycol, which is safe, efficacious and more palatable than other treatments [6].

Eidlitz-Markus and colleagues [5] have presented a prospective study evaluating children with recurrent abdominal pain according to Apley's definition, overt constipation and a new entity called "occult" constipation, which includes children with no initial

complaints but hard stool on rectal exam and/or a plain X-ray showing a distended colon. Of the 76 children in their study, half had constipation – 42.6% occult and 14.2% overt. All constipated children were treated similarly and most showed good short and long-term improvement. The authors conclude that occult constipation is a major cause of recurrent abdominal pain. They should be congratulated for approaching this difficult topic in a scientific fashion. However, these children do fit into the Pediatric Rome category (c): a well-defined subgroup of children with recurrent abdominal pain and altered bowel pattern. However, this study draws attention to one of the most common factors causing recurrent abdominal pain – constipation. When it is overt it is not recurrent abdominal pain syndrome and when the signs and symptoms are subtle the index of suspicion should be raised before the diagnosis of recurrent abdominal pain is made.

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I think there's a world market for about five computers
 1943, Thomas Watson, chairman of the board of IBM

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There is no reason anyone would want a computer in their home
 1977, Ken Olson, president of Digital Equipment

Capsule



Iron sources of pathogenic bacteria

In geochemistry, different isotopes are classically used to track the source of an element. Skaar and colleagues have devised a technique for use in living systems that combines stable isotope labeling with computational genome analysis. They could distinguish whether iron was taken from heme or from transferrin by the pathogenic bacterium *Staphylococcus aureus*, and discovered a previously unrecognized heme uptake system. Mutations in this system attenuate pathogenicity in model infections in the worm, *Caenorhabditis elegans*, and in the mouse. Drugs that target this system could prove useful in treating human infections.

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Capsule



Muscles and acidosis

Muscle fatigue has long been thought to result from the accumulation of lactic acid, a product of anaerobic metabolism. But does fatigue occur because of – or actually in spite of – lactic acid accumulation and consequent decreased pH? Pederson and associates used a preparation of skinned rat skeletal muscle fibers to manipulate key steps in the excitation contraction coupling process. Acidification actually provides a protective effect, such that chloride permeability is decreased, which allows enhanced force generation in response to depolarizing stimuli. Thus, acidosis is probably not the most important factor in reduced muscle performance due to fatigue.

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