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Functional Abdominal Pain and Visceral Hyperalgesia: Why does my tummy hurt so much?

by Susan Agrawal

In the past few years, doctors have begun to recognize the significance of ongoing gut pain that is seemingly without anatomical or infectious cause. Commonly grouped together under the heading of Functional Pain, this type of pain can be both chronic and debilitating to children, as well as puzzling to doctors. Functional Abdominal Pain, as defined by the AAP Subcommittee on Chronic Abdominal Pain in Children, is “Abdominal pain without demonstrable evidence of a pathologic condition, such as an anatomic, metabolic, infectious, inflammatory, or neoplastic disorder; functional abdominal pain may present with symptoms typical of functional dyspepsia, irritable bowel syndrome, abdominal migraine, or functional abdominal pain syndrome.”¹ While in many children, Functional Abdominal Pain is a minor inconvenience that often resolves with time or age, in others, it can severely limit the ability to participate in customary childhood activities like school and play, or even prevent a child from using the gut at all.

In the past, Functional Abdominal Pain was often associated with anxiety, behavioral problems, or other psychological symptoms. While children with abdominal pain are more likely to present with these psychological disorders, there are many children with no underlying psychological or behavioral issues who nonetheless experience significant and remarkable abdominal pain. The pathophysiology of this pain is not well understood, but involves the Enteric Nervous System, or the system of motor and sensory nerves that are present within the entire gut. Because of the vast complexity of neural connections within this network, the Enteric Nervous System is often called the “Little Brain.”

Recently, many gastroenterologists have begun to realize that severe cases of Functional Abdominal Pain may actually be the result of Visceral Hyperalgesia. Visceral Hyperalgesia, which may also be called Visceral Hypersensitivity, is a term that simply means an individual has increased sensitivity to pain in the visceral system of internal organs like the stomach, intestines, or pancreas. Normally, when one eats or drinks, the stomach and intestines stretch to accommodate the meal with no discomfort whatsoever. But in a child with Visceral Hyperalgesia, the mere act of filling the stomach or intestine with a small amount of fluid or food triggers the nerves in the gut to respond as if a painful stimulus has been introduced. Studies on children with irritable bowel syndrome and recurrent abdominal pain have shown that the former group has a much lower threshold for pain in the intestines, while the latter group felt pain in the stomach at a

lower threshold.² If motor nerves are affected, a motility disorder develops, and when sensory nerves are affected, Visceral Hyperalgesia is often the result. It is common for both types of disorders to be present in tandem.

What is painless to most children feels excruciatingly painful to children with Visceral Hyperalgesia. Children with this diagnosis commonly have pain responses to one or more types of agents: pain due to digestive processes such as food entering the gut or liquid stretching the gut; significantly increased pain due to infections, viruses, or other external insults on the gut; and a pain response to psychological events such as anxiety or fear. In many children, all that is needed to cause pain is the introduction of food into the stomach and intestine. Once the pain signal has been turned on, the pain may persist for weeks, months, or years, or may come in intermittent cycles.

What causes Visceral Hyperalgesia? In many cases, it occurs after a virus, illness, or other external assault on the gut. The illness causes temporary damage to the mucus lining of the stomach and intestines, resulting in stomach pain. This pain then sensitizes the nerves in the stomach and/or intestines, causing them to be left “turned on” and hypersensitive to pain. Other gastrointestinal conditions such as pancreatitis, motility disorders, cyclic vomiting (abdominal migraine), or even severe reflux may also trigger Visceral Hyperalgesia. In some children, only one small area of the digestive tract is affected, while in others, most or all of the gut is impacted.

Symptoms of Visceral Hyperalgesia are vague and often very difficult to categorize. In many cases, Visceral Hyperalgesia is a diagnosis of exclusion, after all tests for organic or anatomical disorders have come back negative. All diagnosed children experience pain, but the pain may be localized, diffuse, sharp, dull, burning, intermittent, or constant. Many children with severe Visceral Hyperalgesia also have other symptoms such as bloating, constipation, diarrhea, retching, or vomiting. This is especially the case when both the sensory and motor nerves of the gut are affected. In many children, pain triggers gastrointestinal symptoms like retching and vomiting, which in turn create even more pain and distress. These additional symptoms, coupled with pain, may be so severe that a feeding tube or even a central line must be placed for enteral or intravenous feedings.

Many children with Visceral Hyperalgesia, especially post-infectious hypersensitivity, will recover in time with no treatment. Other children, especially those with underlying gut issues like pancreatitis or a motility disorder, may require substantial intervention to provide adequate nutrition and manage pain and additional gastrointestinal symptoms. In most cases, with adequate management by a pediatric gastroenterologist who specializes in motility issues or Functional Abdominal Pain, a plan to manage symptoms can be developed and the child will be able to live a relatively normal life.

Children with acute-onset Visceral Hyperalgesia may benefit from typical acute pain medications ranging from Motrin to Morphine. In general, children who need acute pain relief are given non-narcotic pain relievers such as Tylenol or Motrin, or pseudo-opiates like Tramadol, since narcotics and opiates disturb motility of the gut and may worsen gut function in the long run. Once Visceral Hyperalgesia has become more habitual, other

pain medications may be more appropriate. Commonly used medications include tricyclic antidepressants, especially Amitriptyline (Elavil), Nortriptyline (Pamelor), and Imipramine (Tofranil). Medications to treat neuropathic pain have also proven helpful, especially Gabapentin (Neurontin) and its new cousin Pregabalin (Lyrica). Other possible medications include Nifedipine (Procardia); Dicyclomine (Bentyl), Alosetron (Lotronex) or Tegaserod (Zelnorm) for children with more intestinal issues; Ondansetron (Zofran) to prevent vomiting; Hyoscyamine (Levsin) for children with spasms; and other anticholinergic and anti-nausea medications. Older children, particularly those with concurrent psychological disorders, may benefit from behavioral therapy or consultation with a chronic pain psychologist. Some children may also improve by receiving continuous small feeds through a feeding tube, particularly feedings directly into the jejunum via a GJ or J tube. Children with extremely severe Visceral Hyperalgesia may need a central line and TPN (IV) feedings to allow total gut rest.

Visceral Hyperalgesia is a difficult condition to diagnosis, understand, and treat. But with proper treatment, most children can resume the normal activities of childhood. Many will even overcome their Visceral Hyperalgesia over a period of six to eighteen months. Success depends entirely on finding a pediatric gastroenterologist familiar with Visceral Hyperalgesia, its causes, symptoms, and treatment.

¹ American Academy of Pediatrics Subcommittee on Chronic Abdominal Pain. Chronic Abdominal Pain in Children. *Pediatrics* 2005;Vol. 115 No. 3:812-815.

² Di Lorenzo C, Youssef NN, Sigurdsson L, Scharff L, Griffiths J, Wald A. Visceral hyperalgesia in children with functional abdominal pain. *Pediatrics* 2001;Vol. 139 No. 6:838-843.