PEDIATRIC CHRONIC ABDOMINAL PAIN

Pediatric Pain PRN Curriculum

Ann & Robert H. Lurie Children's Hospital of Chicago

The MAYDAY Fund

Table of Contents

Objectives

- Differentiate patterns of pain and other symptoms common to children with inflammatory bowel disease (IBD) as compared to children with functional gastrointestinal disorders.
- Develop a multimodal plan of care for pediatric abdominal pain prevention and treatment.
- Describe the unique aspects of pain assessment and management for children with functional gastrointestinal disorders.

Pediatric Abdominal Pain

Functional Gastrointestinal Disorders

There are no observable or measurable structural abnormalities found to explain persistent abdominal pain symptoms.

- Functional Dyspepsia
- Irritable Bowel Syndrome
- Functional Abdominal Pain
- Abdominal Migraine

Pediatric Abdominal Pain

- Affects 4-53% of children
- Accounts for 25% of pediatric gastroenterology office visits and may be a precursor to IBS
- Average cost of $6000 for diagnostic work up for functional dyspepsia per child

Violet

What is your response?

What can be done immediately in the ED to relieve Violet's abdominal pain?

Violet is a 12-year-old who presents with her mother to the ED for severe 9 out of 10 periumbilical abdominal pain of an intermittent crampy quality. She is afebrile, and has no sick household contacts. She is curled in a fetal position.

Types of Abdominal Pain

Functional Dyspepsia

Other terms used to describe these chronic peristalsis sensations in the upper GI tract (this condition) include:

- *non-ulcer dyspepsia,*
- *pseudo-ulcer syndrome,*
- *pyloric-duodenal irritability,*
- *nervous dyspepsia, or*
- *gastritis*

Cause

Causes could be:

- Excessive acid secretion
- Inflammation of stomach/duodenum
- Food allergy/dietary influences
- Medication side effects: ASA, NSAIDs
- H. Pylori

Treatment

- Dietary modification: Avoid large meals or irritating foods (for example, spicy foods or coffee,).
- Obese children might find relief from weight loss.
- Elevate HOB.
- Stop smoking.
- Medications:
  - Sucralfate- *forms a coating over ulcers to protect area from further injury. Antacids should be taken 30 minutes before or after sucralfate*
  - H2 Blocker- *blocks histamine in the parietal cells of the stomach to decrease stomach acid production.*
  - Proton-pump inhibitor (PPI)- *Irreversibly block acid production at the terminal stage of gastric acid secretion.*

Functional Abdominal Pain

Functional abdominal pain is commonly reported in females age 4-6 years and adolescents. It is related to stress and psychological distress.

Rome III Criteria Must include all the following:

- Episodic or continuous abdominal pain
- Insufficient criteria for other Functional Gastrointestinal Disorders
- No evidence of an inflammatory, anatomic, metabolic or neoplastic process that explains symptoms

Functional Abdominal Pain (FAP) syndrome:

- At least 25% of the time with one or more:
  - Loss of daily function
  - Additional somatic symptoms (headache, limb pain or difficulty sleeping)

There is little evidence to support the use of pharmacology in FAP.

Symptoms

- Non-radiating pain lasting 1-3 hours around umbilicus
- Altered bowel habits
- Pallor
- Sweat
- Nausea
- Vomiting
- Changes in oral intake
- Sleep disturbances

Treatment

- Biopsychosocial approach
  - Cognitive Behavioral Therapy (CBT)
  - Psychology
- Dietary treatment
- Sleep hygiene
- Yoga
- TENs (Transcutaneous Electrical Nerve Stimulation)
- Lidoderm
- Antidepressant
  - Amytriptyline
  - SSRI – citalopram

Abdominal Migraines

Commonly children ages 5-9

Symptoms

- Abdominal pain
  - Midline, periumbilical, or poorly localized
  - Dull/sore quality
  - Moderate to severe intensity
- Nausea
- Vomiting
- Most children with abdominal migraines will have migraines as adults

Treatment

- Dietary Modifications
- Vitamins (riboflavin, magnesium, others) and supplements
- Medications:
  - Antidepressants (amitriptyline).
  - Anti-nausea medication
  - Gabapentin
  - NSAIDs
  - Triptans- *Abortive migraine treatment, NOT for prevention*
  - Pizotifen- *Prevents the frequency of recurrent migraines, but not a first line agent due to side effects of drowsiness and weight gain*

Violet

What is your response?

What treatments would be indicated?

CT scan reveals normal appendix and mesenteric adenitis with significant amount of bowel contents.

IBS and IBD

Irritable Bowel Syndrome (IBS)

- Abdominal pain or discomfort associated with altered bowel function and improved with defecation.

Inflammatory Bowel Disease (IBD)

Prevalence

- Approximately 1.6 million Americans currently have an inflammatory bowel disease (IBD).
- About 70,000 new cases of IBD are diagnosed in the US each year.
- Approximately 5% of IBD cases are pediatric patients.
- Diagnosis is typically made between 15 and 35 years.
- Rare in children < 8 years of age.
- IBD includes Ulcerative Colitis & Crohn's Disease
- When diagnosed in childhood, IBD may be more extensive and severe than when diagnosed as an adult.
- IBD is treated with medical management, but no cure.
- In children, Crohn's disease occurs twice as frequently as ulcerative colitis.
- Slightly more boys than girls develop IBD (especially Crohn's disease) in childhood.

Casey

What is your response?

What treatments would be indicated?

Casey is a 16-year-old who presents with her mother for severe abdominal pain with urgent and frequent multiple loose to liquid bowel movements (BM).

Casey states that even after having a BM she feels like she still needs to go and has noticed bright red blood in her stool. With defecation, Casey reports intermittent 6/10 abdominal and rectal pain. Pain is aggravated by BM and alleviated after BM.

GI consult and biopsy revealed UC.

Pediatric IBD: Significance

Not all complications of IBD are confined to the GI tract. For reasons that are not entirely understood, IBD related symptoms may affect other parts of the body. The most common of these complications affect the skin and bones.

Extra intestinal complications may be evident in the:

- eyes (redness, pain, and itchiness)
- mouth (sores)
- joints (swelling and pain)
  - Arthritis
  - Arthralgias
  - Sacroiliitis
  - ankylosing spondylitis
- skin (tender bumps, painful ulcerations, and other sores/rashes)
- bones (osteoporosis)
- kidney (stones)
- liver (primary sclerosing cholangitis, hepatitis, and cirrhosis)—occurs rarely.

Pediatric IBD: Significance

Ulcerative Colitis

- Limited to large intestine (colon) and the rectum
- Inflammation in innermost layer of intestinal lining
- Usually begins in rectum/lower colon

- 48% of people with ulcerative colitis are in remission
- 30% have mild disease activity
- 20% have moderate disease activity
- 1% to 2% have severe disease

Crohn's Disease:

- Can affect any part of the GI tract from mouth to anus.
- Most commonly affects the end of the small intestine (ileum)
- Can appear in "patches"
- Inflammation may extend through entire thickness of bowel wall

- About 50% of patients will be in remission or have mild disease over the next five years
- Relapse rates at 1, 2, 5, and 10 years are estimated at 20%, 40%, 67%, and 76%, respectively.
- 35% will have one or two relapses
- 11% will have chronically active disease

Casey

What is your response?

What can be done immediately to relieve Casey's abdominal pain?

What pain medications would be indicated?

Type your answer here.

Acute Abdominal Pain

- Analgesia SHOULD be administered during evaluation
- Consider PCA for post surgical pain with those who can comprehend its function
- "Treat by the clock"

Traditional or old surgical train of thought "no pain meds for acute abdominal pain until diagnosis has been made" has been challenged over the years. Many studies have shown safety and accuracy in diagnosis without compromising pain control.

When pain is constantly present, analgesics should be administered at regular intervals ("by the clock" and not on an "as needed" basis) while monitoring side-effects.

See the WHO guidelines on the pharmacological treatment of persisting pain in children with medical issues, 2012. www.who.int

Gastroesophageal Reflux Disease: GERD

Neonatal & Infant Symptoms:

- Arching
- Colic
- Gagging
- Irritability
- Pneumonia
- Poor feeding, growth and or weight gain
- Difficulty with breathing
- Vomiting
- Wheezing

Constipation

Treatments

Bulk Producing Laxative

- Psyllium

Osmotic Laxative

- Magnesium citrate
- Polyethylene glycol
- Lactulose
- Glycerin

Lubricant Laxatives

- Mineral Oil

Stool Softeners

- Docusate

Stimulant

- Senna
- Bisacodyl

If an opioid is being used as part of treatment, then bowel prophylaxis needs to be considered.

The intensity of pain from constipation can be severe

- Intermittent Pain
- May be associated with nausea

Treatment for Pediatric GI Pain

Commonly Used Medications for Abdominal Pain

- Antispasmodics
  - Hyoscyamine (Levsin, Donnatal)
  - Dicyclomine (Bentyl)
- Sucralfate (Carafate)
- PPI/H2 Blocker
- TCA's/SSRI's/SNRI's
- Gabapentin
- NSAIDs

Antispasmodics:

- Slow peristalsis by relaxing stomach and intestinal muscles to reduce cramping

Antidepressants:

- **SNRIs** inhibit the reuptake of Serotonin (5-HT3) and norepinephrine (NE) and 5-HT3 and NE modulate descending inhibition of ascending pain pathways in brain and spinal cord.
- **Tricyclic antidepressants** also inhibit 5-HT3 and NE, interacts with GABA, blocks sodium channels, and are alpha-1 adrenergic blockers

Anticonvulsants:

- Alpha-2-delta ligand calcium channel antagonists, such as **gabapentin and pregabalin**,
- Other anticonvulsants used to treat pain block voltage-gated sodium and calcium channels and/or inhibit glutamate release

Commonly Used Intervention Techniques for Abdominal Pain

- Epidural
- Trans Abdominal Plane (TAP) Block
- Intercostal block
- Paravertebral Block
- Acupuncture

Abdominal coverage from epidurals is extensive and catheter placement is technically unchallenging.

TAP blocks provide limited analgesic coverage, hence multiple injections are usually required. Traditionally these blocks have blind end points (pops) making their success unpredictable; but they can effectively cover entire abdomen.

Intercostal and paravertebral blocks are helpful to alleviate pain when the catheters are placed with guidance. These techniques are more effective for rib fractures and chest pain; but continuous paravertebral block has been shown to be superior to epidural anesthesia for unilateral renal surgery.

Treatment Plan

Treatment Plan

- Perform a comprehensive initial pain assessment.
- Clarify difference between acute and chronic pain. Review previous studies and results to explain lack of benefit of additional testing.
- Establish individualized multidimensional realistic pain treatment goals with patient and family.
- Provide individualized, multimodal, interdisciplinary treatment plan.
- Educate patient and family about risks, benefits, limitations and shared responsibilities for pain management plan.

In Summary…

Key Points

Gastrointestinal Disorders

It's important to differentiate between patterns of pain and other symptoms common to children with inflammatory bowel disease (IBD) compared to children with functional gastrointestinal disorders.

- Pediatric abdominal pain affects 4-53% of children. It accounts for 25% of pediatric gastroenterology office visits and may be a precursor to IBS.
- Approximately 5% of IBD cases are pediatric patients. Diagnosis is typically made between 15 and 35 years. IBD includes Ulcerative Colitis and Crohn's Disease. It is treated with medical management, but there is no cure.

Prevention and treatment are based on a multimodal plan of care for pediatric abdominal pain.

- Common medications include Antispasmodics, Carafate, PPI/H2 Blocker, TCA's/SSRI's, Gabapentin, and NSAIDs.
- Other interventions include epidural, TAP Block, intercostal block, paravertebral block, and/or acupuncture.

Appendix

References

Eck, J. B., Cantos-Gustafsson, A., & Ross, A. K, et. al. (2002). What's new in pediatric paravertebral analgesia. Tech Reg Anesth Pain Management. (6), 131.

Ephgrave K. Extraintestinal manifestations of Crohn's disease. Surg Clin North Am. 2007;87(3):673-680.

Kappelman MD, Moore KR, Allen JK, Cook SF. Recent trends in the prevalence of Crohn's disease and ulcerative colitis in a commercially insured US population. Dig Dis Sci (2013) 58:519-525. 18. Kugathasan S, Hoffmann RG. The incidence and prevalence of pediatric inflammatory bowel disease (IBD) in the USA. J Pediatr Gastroenterol Nutr. 2004;30:S48-S49.

Langholz E, Munkholm P, Davidsen M, Binder V. Course of ulcerative colitis: analysis of changes in disease activity over years. Gastroenterology. 1994;107:3-11.

Lapidus A, Bernell O, Hellers G, Lofberg R. Clinical course of colorectal Crohn's disease: a 35-year follow-up study of 507 patients. Gastroenterology. 1998;114:1151-1160.

Rasquin A., Di Lorenxo, C, Forbes, D, et al. (2006). Childhood functional gastrointestinal disorders: child/adolescent. Gastroenterology. 130: 1527-1537.

Schechter, N. L., Palermo, T. M., Walco, G. A., & Berde, C. (2010). Persistent pain in children. In S. M. Fishman, J.C. Ballantyne, & J. P. Rathell (Eds.), Bonica's management of pain (4th ed., pp. 767-780). Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins.

Tobias, J. D, & Deshpande, J . K. (1996). Pediatric Pain Management for Primary Care, 2nd edition. American Academy of Pediatrics.

Van Limbergen J, Russell RK, Drummond, HE, et al. Definition of phenotypic characteristics of childhood-onset inflammatory bowel disease. Gastroenterology. 2008;135:1114-1122.