Abdominal Pain In Children
Abdominal Pain In Children

• Learning Objectives
  • 1. Understand the spectrum of abdominal pain in children
  • 2. Incidence, prevalence and management of abdominal pain in children
  • 3. To develop a staged work up with testing and referral for pediatric abdominal pain
Disclosures

• If only....
History of Abdominal Pain
Child with Abdominal Pains

Note: This is not the actual book cover.
History - Dr. Apley

• The Anti-Phony Phrase Club:
• Example: “There is nothing wrong”. Of course there is something wrong or they would not have sought our help
• Example: “Don’t worry”. Really, of course parents will worry
• Example: “They will grow out of it”. Children generally do not grow out of conditions
History

- Dr. Apley’s main point was “stress families”
- A child with recurrent pain likely comes from a family that is experiencing pain and is unlikely to resolve it unless the painful aspects of his environment are changed
- This set the tone for the approach to childhood chronic abdominal pain for decades
Acute abdominal pain

Evidence of trauma?
  No
  Fever?
    No
  Yes
    Urinary tract infection
    Pharyngitis
    Gastroenteritis
    Mesenteric lymphadenitis
    Pneumonia
    Appendicitis
    Pelvic inflammatory disease

Evidence of sickle cell anemia?
  No
  Yes
    Sickle cell crisis

Left-sided pain
  No
  Yes
    Constipation
    Ovarian/testicular torsion
    Mittelschmerz

Middle to right-sided pain?
  No
  Yes
    Appendicitis
    Ovarian/testicular torsion
    Mesenteric lymphadenitis
    Mittelschmerz

Present in other household contacts?
  No
  Yes
    Food poisoning
    Gastroenteritis

Sexually active?
  No
  Yes
    Pelvic inflammatory disease
    Ectopic pregnancy

Paleness/purpura?
  No
  Yes
    Hemolytic uremic syndrome
    Henoch-Schönlein purpura

Blood in stool?
  No
  Yes
    Inflammatory bowel disease
    Hemolytic uremic syndrome
    Henoch-Schönlein purpura
    Gastroenteritis

Hematuria?
  No
  Yes
    Renal calculi
    Renal trauma
    Urinary tract infection

Evidence of obstruction?
  No
  Yes
    Malrotation
    Intussusception
    Volvulus

Refer or observe.
Chronic Abdominal pain

- **H2d. Childhood Functional Abdominal Pain**
  - *Diagnostic criteria* Must include **all of the following:**
    - . Episodic or continuous abdominal pain
    - . Insufficient criteria for other FGIDs
    - . No evidence of an inflammatory, anatomic, metabolic, or neoplastic process
  - that explains the subject’s symptoms
  - * Criteria fulfilled at least once per week for at least * months prior to diagnosis
Irritable Bowel Syndrome

• Diagnostic Criteria for Irritable Bowel Syndrome
• Must include all of the following:
• 1. Abdominal pain at least 4 days per month associated with one or more of the following:
  a. Related to defecation
  b. A change in frequency of stool
  c. A change in form (appearance) of stool
• 2. In children with constipation, the pain does not resolve with resolution of the constipation (children in whom the pain resolves have functional constipation, not irritable bowel syndrome)
• 3. After appropriate evaluation, the symptoms cannot be fully explained by another medical condition
• Criteria fulfilled for at least 2 months before diagnosis.
Red Flags

- Potential Alarm Features in Children With Chronic Abdominal Pain
- Family history of inflammatory bowel disease, celiac disease, or peptic ulcer disease
- Persistent right upper or right lower quadrant pain
- Dysphagia
- Odynophagia
- Persistent vomiting
- Gastrointestinal blood loss
- Nocturnal diarrhea
- Arthritis
- Perirectal disease
- Involuntary weight loss
- Deceleration of linear growth
- Delayed puberty
- Unexplained fever
“Well, yes, we could fix it in Photoshop, but your arm would still be broken.”
What has changed?
What has changed?
Some Things Never Change
Case # 1

- 9 year old boy with periumbilical abdominal pain for as long as he can remember
- No diarrhea, stools are Bristol 4-5
- No bleeding
- Appetite is fair, picky eater per mother
- Plays soccer, straight A student
- FH: MGM-diverticulitis, IBS
- Mother-Migraines
What Else Do You Want To Know?

- H/H: 10.5/33, MCV 81
- Comp Chem panel-all normal
- ESR: 7
- CRP: 0.5
- Calprotectin: 68
- H. Pylori: IgM +
- H. Pylori stool: negative
- TTG IgA: 65
Endoscopy & Biopsy in Celiac Disease

A. Normal small intestine
B. Normal Villi
C. Celiac Disease
D. Villous Atrophy
Celiac tests

- Recommended screening test: TTG IgA
- If IgA deficient: TTG IgG
- In children under 3: anti-endomysial IgA
- Deaminated Antigliadin IgA-similar sensitivity and specificity
- HLA DQ2 and DQ8- only specific situations
# Celiac Disease

<table>
<thead>
<tr>
<th>Variable</th>
<th>Celiac Disease</th>
<th>Gluten Sensitivity</th>
<th>Wheat Allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval between exposure to gluten and onset of symptoms</td>
<td>Weeks to years</td>
<td>Hours to days</td>
<td>Minutes to hours</td>
</tr>
<tr>
<td>Pathogenesis</td>
<td>Autoimmunity (innate and adaptive immunity)</td>
<td>Possibly innate immunity</td>
<td>Allergic immune response</td>
</tr>
<tr>
<td>HLA</td>
<td>Restricted to HLA-DQ2 or HLA-DQ8 (in approximately 97% of positive cases)</td>
<td>Not restricted to HLA-DQ2 or HLA-DQ8 (HLA-DQ2–positive, HLA-DQ8–positive, or both in 50% of patients)</td>
<td>Not restricted to HLA-DQ2 or HLA-DQ8 (HLA-DQ2–positive, HLA-DQ8–positive, or both in 35–40% of patients, similar to the general population)</td>
</tr>
<tr>
<td>Autoantibodies</td>
<td>Almost always present</td>
<td>Always absent</td>
<td>Always absent</td>
</tr>
<tr>
<td>Enteropathy</td>
<td>Almost always present</td>
<td>Always absent (slight increase in the intraepithelial lymphocyte count)</td>
<td>Always absent (eosinophils in the lamina propria)</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Both intestinal and extraintestinal; gastrointestinal symptoms not distinguishable from those of gluten sensitivity and wheat allergy</td>
<td>Both intestinal and extraintestinal; gastrointestinal symptoms not distinguishable from those of celiac disease and wheat allergy</td>
<td>Both intestinal and extraintestinal; gastrointestinal symptoms not distinguishable from those of celiac disease and gluten sensitivity symptoms</td>
</tr>
<tr>
<td>Complications</td>
<td>Coexisting conditions; long-term complications</td>
<td>Absence of coexisting conditions and long-term complications</td>
<td>Absence of coexisting conditions; short-term complications (including anaphylaxis)</td>
</tr>
</tbody>
</table>
Case # 2

• 13 Year old girl with 3 months of abdominal pain, non descript, non localized

• Pain is not associated with eating, does not wake her from sleep

• Stools are variable, from constipation Bristol 2 to very loose, Bristol 6, no bleeding except when constipated

• She missed 12 days of school already this year
What Else Do You Want to Know?

- History: 90% of the diagnosis is by history
- She spends a long time in the bathroom
- No weight loss, actually has gained weight
- No fever, rash, joint pain
- Menarche age 12, LMP 4 weeks ago
- FH: Mom-IBS, Dad-psoriasis, sibling-ADHD
- SH: loves music, parents separated, excellent student
Case # 2

- Trial of Zantac andPrevacid did not help
- Trial of Miralax did not help though the stools were better
- Sonogram was normal
- Upper Endoscopy was normal
Functional Disorders

- Diagnosis is clinical by history, exam and limited work up
- In adults, functional disorders are 40% of referrals
- Normal physical exam should include growth assessment, perianal inspection
- Recommended lab screen might include CBC, CRP or ESR, TTG and if diarrhea a calprotectin
Rule #1
Very Important Rules

• Rule #1
• If you feel like this after taking the history, the diagnosis is functional

• Rule #2
• If you have abdominal pain after taking the history, the diagnosis is functional
<table>
<thead>
<tr>
<th>Bristol stool chart</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Separate hard lumps, like nuts (hard to pass)</td>
</tr>
<tr>
<td>Type 2</td>
<td>Sausage-shaped, but lumpy</td>
</tr>
<tr>
<td>Type 3</td>
<td>Sausage-shaped, but with cracks on surface</td>
</tr>
<tr>
<td>Type 4</td>
<td>Sausage or snake like, smooth and soft</td>
</tr>
<tr>
<td>Type 5</td>
<td>Soft blobs with clear-cut edges (easy to pass)</td>
</tr>
<tr>
<td>Type 6</td>
<td>Fluffy pieces with ragged edges, mushy</td>
</tr>
<tr>
<td>Type 7</td>
<td>Watery, no solid pieces (entirely liquid)</td>
</tr>
</tbody>
</table>
Functional Disorders Approach

• FAPDs are common, occurring in approximately 10 to 20 percent of children.

• The pain of FAPDs is real; it is thought to be caused by a heightened sensitivity to the normal function of the stomach and bowel. (Visceral Hyperalgesia)

• Like other types of pain, pain in FAPDs can be triggered, exacerbated, or maintained by environmental and psychosocial factors, including stress, anxiety, and social reinforcement (eg, attention, staying home from school).

• The pain of FAPDs is not life-threatening and does not require activity restriction.
Functional Disorders Approach

- Treatment focuses on return to normal activity despite discomfort – rehabilitation
- Management of pain involves avoiding triggers and improving coping skills; the pain may persist, but the child's and family's quality of life can be improved
- Goals for management should be realistic (eg, maintenance of normal activities, increased tolerance of symptoms
- Chronic pain, regardless of the etiology, can be associated with depression or anxiety (both as a cause and an effect)
Functional Disorders
Treatment

- Multiple interventions have been evaluated
- There is good evidence for psychologic interventions like CBT
- In meta analysis, improvement with placebo effect can be 40% over time and resolution 17%
- Back to school plan is critical
Functional Disorders Treatment

Probiotics
8 facts you should know

70% of our immune system resides in our gut.

Probiotics in our body outweigh our brain. The typical human brain weighs about 3 pounds, and a healthy human body will have over 3.5 pounds of probiotic bacteria and organisms.

Between 60 and 70 million Americans are affected by digestive issues.

8 out of 10 adults reported having a digestive issue for which they purchased a product.

Our digestive system is home to 10% of the bacteria in our body.

Americans invested more than $2 billion on digestive health supplements in 2014.
Functional Disorders Treatment

- Probiotics—data
- Cochrane review-2017-low quality evidence that there may be a moderate effect on improvement in pain over 3 months
- NNT was 8
- Recent meta-analysis of 17 studies: Lactobacillus Rhamnosus GG may be helpful. No evidence to support L. Reuteri, Bifidobacterium.
Probiotics

- Lactobacillus GG
- L. Reuteri—
- Saccharomyces boulardii
- L. Acidophilus
- B. Lactis
- Lactobacillus bulgaricus and Streptococcus thermophilus-common in yogurt
Diet Treatment

• FODMAP diet
• First what are FODMAPS?
• Fermentable, Oligosaccharides, Disaccharides,
• Monosaccharides, Polyols.
• Oligo=Fructans or inulin
• Disacc=lactose
• Mono=fructose
• Polyols=sorbitol
Diet Treatment

• FODMAP diet is essentially:
  • Gluten Free
  • Lactose Free
  • Restricted Fruit -
  • Restricted vegetables
  • No high fructose syrup
Diet Treatment

- Multiple adult studies show symptom improvement in gas, bloating, abdominal pain
- One randomized control trial in children ages 7-17 showed improvement after 2 days
- No long term studies
Important Rule #3

• No child in Northern Virginia is not stressed, if they deny it they simply lack insight

• The same is true for their parents
Psychologic Component

- In a retrospective study, FGID leading to chronic nausea was associated with a higher prevalence of comorbid conditions such as migraines, sleep problems, fatigue, and anxiety.

- Some studies have focused on children’s body weight, anxiety, and comorbidities to explain IBS in children. For instance, a cross-sectional study of 450 children found that there was a higher prevalence of FGID in obese-overweight children (47%) compared with normal-weight children (27%).
Case # 3

- 13 year old girl with persistent epigastric to periumbilical pain and nausea
- No vomiting
- 3 pound weight loss
- Normal stool daily, Bristol 4-5
- No nocturnal pain
- Pain is worse after eating anything
Case #3- Dyspepsia Differential

- Peptic ulcer disease
- Gastroesophageal reflux
- Eosinophilic Esophagitis
- H. Pylori gastritis
- Non-Ulcer dyspepsia
- NSAID induced Gastritis
- Rare things like Crohn’s disease, collagenous gastritis
Please Don’t

• Order an UGI
• Order H. Pylori serology
• Order H. Pylori stool or breath test
• Do a flat plate
• Treat for H. Pylori
• Suggest probiotics
Please Do

• Consider a trial of an H2 Blocker
• Avoid or withdraw NSAIDs
• Consider a trial of PPI
• Ask about risk factors for functional disease
• Look for risk factors of EoE such as atopic dermatitis, food allergies, eczema
H. Pylori

- Current guidelines recommend against test and treat strategy
- Current evidence suggests eradication of H. Pylori in the absence of mucosal disease will not improve the symptoms
- Children with recurrent abdominal pain without alarm symptoms likely have functional pain regardless of their H. Pylori status
H. Pylori
Duodenal Ulcer
Nodular Gastritis
Case #4

- 14 year old with persistent periumbilical pain
- Worse after eating, especially dairy
- No vomiting but mother feels he is eating less
- Weight down 1-2 pounds
- Stool 2 times per day, Bristol 5
- No bleeding
- Recent travel to Italy
Case #4

- PMH: CMPI as infant, GER on meds to a year
- FH: mother-Fibromyalgia, hypothyroid
- MgM-colitis
- Father-psoriasis
- SH: straight A student, travel soccer player, anxious recently
- ROS: no fevers, +arthralgias, no rash,
Case #4

• Physical Exam:
  • Prepubertal
  • Slight tenderness in periumbilical area
  • Weight is at 57%
  • Height is at 34%
  • Height 2 years ago was 62%
Growth
Skin Tags
Labs

- CRP: 14
- CBC: H/H-11/33.5
- MCV: 72
- Comp. Chem: normal except albumin 3.3
- Calprotectin: normal
- H. Pylori IgM: positive
- Flat plate: constipation
THIS HERE IS OUR BRAND NEW COLONOSCOPY 3000 XL PROBE! IT TAKES 300 MEGAPIXEL IMAGES, HAS A LASER SCALPEL, AND MORE ... I CAN'T WAIT TO TRY THIS BABY OUT!
Case #4
Treatment

• Induction: steroids, biologic therapies or nutritional therapy
• Maintenance: Methotrexate, biologic therapies, nutritional therapy