Pediatric (Chronic Recurrent) Abdominal Pain

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10.7.2014

Disclosures
• None

Educational Objectives
• Develop a differential diagnosis
• Recognize alarming signs & symptoms
• Discuss major functional related disorders
• Discuss few common organic etiologies
• Recognize when to refer

Chronic abdominal pain
• 2%-4% visits to primary care clinicians
• 50% visits to pediatric GI specialists
• Prevalence
  – Community- and school-based studies\textsuperscript{1,2}
  • 13–38% of children/adolescents report weekly pain
  • 24% have symptoms > 8 weeks


Chronic abdominal pain
• Significant proportion will have functional abdominal pain or IBS
  – Classified under functional GI disorders
  – Characterized by chronic or recurrent GI symptoms
    • Not explained by structural or biochemical abnormalities

\textbf{Recurrence abdominal pain presentation}

\begin{itemize}
  \item \textbf{Functional}
  \item \textbf{Organic}
  \item \textbf{GI etiology}
  \item \textbf{Non-GI etiology}
\end{itemize}
Functional GI disorders

• Based Rome III criteria
  – 4 categories recognized in children:
    • Functional dyspepsia
    • Irritable bowel syndrome (IBS)
    • Abdominal migraine
    • Childhood functional abdominal pain
  – Subtypes may differ in symptom patterns, pathophysiology & management


Functional dyspepsia

• Need ≥ 1 per week ≥ 2 months:
  – Persistent or recurrent pain in upper abdomen
  – Not relieved by defecation or associated with change in stool frequency or form
  – No other process

Irritable bowel syndrome

• Need ≥ 1 per week ≥ 2 months:
  – Abdominal pain associated with ≥ 2 for ≥ 25% of time:
    • Improvement with defecation
    • Onset associated with a change in stool frequency
    • Onset associated with a change in stool form
  – No other process

Abdominal migraine

• Paroxysmal intense, acute periumbilical pain lasting ≥ 1 hour
  – Intervening normal health lasting weeks-months
  – Pain interferes with normal activities
  – Pain associated ≥ 2:
    • Anorexia, Nausea, Vomiting, Photophobia, Palp, HA
  – No other process

Criteria fulfilled ≥ 2 times in last 12 months

Functional abdominal pain

• Need ≥ 1 per week ≥ 2 months:
  – Episodic or continuous abdominal pain
  – Insufficient criteria for other functional GI disorders
  – No other process

Organic Etiologies

Organic GI

• Acid peptic disease (ulcers)
• Infectious causes (parasitic)
• Mucosal disease (esophagitis, gastritis, enteropathy)
• Gallbladder disease (cholelithiasis, cholecystitis)
• Pancreatic disorders (pancreatitis, pseudocyst)
• Chronic hepatitis
• Inflammatory bowel disease
• Surgical disorders (hernia, intussusception)
• Carbohydrate malabsorption
• Constipation
• Tumor

Organic non-GI disorders

• Respiratory inflammation/infection
• Recurrent UTI (pyelonephritis, cystitis)
• Ureteropelvic junction obstruction
• Nephrolithiasis
• Gynecologic disorders
• Porphyria
• Lead poisoning
• Sickle cell disease

Red Flags

• Weight loss
• Recurrent oral ulcers
• Bilious emesis/hematemesis
• Unexplained fevers
• Nocturnal symptoms
• Melena
• Hematochezia
• Occult GI blood loss
• Joint symptoms
• Dysuria/haematuria/flank pain
• Delayed puberty
• Linear growth failure
• Family history of GI disease

Dysphagia
• Anemia
• Leukocytosis
• Hyperalbuminemia
• Unexplained rashes
• Chronic unexplained diarrhea
• Acute abdomen (guarding)
• Elevated inflammatory markers (ESR, CRP, platelets)
• Jaundice/scleral icterus
• Anal skin tags, fissures
• Referred pain to back, shoulders

Organic GI disorders

• Inflammatory bowel disease (IBD)
• Celiac disease
**IBD-Presentation**

- **Classically**
  - Crohns: pain, diarrhea and weight loss
  - Ulcerative Colitis: bloody diarrhea
- **Other features:**
  - Short stature, weight loss, pubertal delay
  - 30% extra-intestinal manifestations
    - Arthritis (axial or peripheral)
    - Cutaneous (erythema nodosum, pyoderma gangrenosum)
    - Eye disease (episcleritis, uveitis)

**IBD-screening**

- **Assess growth**
- **Labs:**
  - CBC
  - Albumin
  - ESR, CRP
  - Fecal calprotectin

**Celiac-Presentation**

- **Presentation:**
  - Classic: Diarrhea, failure to thrive, distension
    - More than adults
  - Non-classical
    - Iron deficiency, skin lesions, short stature
  - Subclinical
    - Diagnosed on screening

**Celiac-Screening**

<table>
<thead>
<tr>
<th>Serological Test</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tissue Transglutaminase IgA (TTG)</td>
<td>98 (74-100)</td>
<td>97 (78-100)</td>
<td>Preferred for screening: (-) in IgA deficiency</td>
</tr>
<tr>
<td>Antidiomysium IgA</td>
<td>90 (75-96)</td>
<td>98 (91-100)</td>
<td>(-) in IgA deficiency</td>
</tr>
<tr>
<td>Deamidated gliadin IgA</td>
<td>89.7-95.1</td>
<td>86.3-93.1</td>
<td>(-) in IgA deficiency</td>
</tr>
<tr>
<td>Deamidated gliadin IgG</td>
<td>80.1-88.6</td>
<td>96.0-96.9</td>
<td></td>
</tr>
</tbody>
</table>

*Need to be on a gluten containing diet*
Celiac disease

- Assess growth
- Labs:
  - Serology
  - Avoid nonstandard testing
- Avoid gluten free diet trials

Imaging

CT significantly ↑, 2% (1999) → 16% (2007), P < .001

No changes in
- Use of US
- Patients admitted or transferred
- Patients diagnosed with appendicitis


Functional GI disorders

- Diagnosis
  - Symptom-based
    - Rome III Criteria
  - Associated with significant impairment
    - Low self-reported QOL scores
      - Comparable to children with IBD
    - ↑ school absenteeism, health-care utilization, family disruption

Management

- Most with mild symptoms improve with reassurance and time
- Long-term follow-up studies
  - Significant number experience symptoms into adulthood

Management

- Establish effective patient–physician relationship
  - Adopt 'active listening approach'
  - Positive encouraging attitude towards treatment
  - Reassurance
    - Diagnosis is not a failure to identify an underlying illness.
    - Se expectation for normal results may help

- Explain pathophysiology of visceral pain
  - Brain–gut axis
- Treatment response often gradual
  - Set realistic goals
    - Improve coping, maintain of normal daily
  - No expectation of prompt cure
- Therapeutic approaches
  - Dietary, psychosocial, pharmacologic
Dietary interventions

Restrictive diets
- Lactose intolerance
  - Often implicated as possible factor in IBS
  - Lactase activity peaks ~3 years then gradually decreases
  - Considered for older children and adolescents
    - 1 week strict lactose free trial usually adequate
    - Confirmatory test:
      - Lactose breath test

- Fructose malabsorption
  - Persistence of fructose (high-fructose corn syrup)
    - Osmotic diarrhea, colonic bacteria, gas production
  - Some studies showed benefit
  - Confirmatory test:
    - Fructose breath test

Fiber
- Routinely used
  - Can produce more regular stools, ↓ abdominal pain in FAP or IBS

- Supportive data
  - Limited in adults
    - Meta-analysis, benefit limited to psyllium
  - In children, sparse data

Probiotics
- Alterations to commensal GI flora
  - Dysmotility, visceral hypersensitivity, colonic fermentation
- IBS triggered by infections & antibiotic use
- Problems
  - Different formulations, dosages & outcome measures in adult & pediatric studies

  - Randomized 52 children
    - 5 g corn fiber cookie or placebo BID x 6 weeks
      - 50% fiber group improved vs 27%
- Christensen M., Am J Dis Child 1986
  - Randomized 40 children
    - Ispaghula husks (66% fiber) or placebo (2%) cereal BID x 7 weeks
      - No significant difference
  - Empiric trial is low risk usually low risk
Probiotics

• Bausserman et al. J Pediatr 2005
  – Randomized 64 children
    • Lactobacillus GG or placebo BID x 6 weeks
      • Same pain relief 44% vs 40% in placebo
    • ↓ perception of abdominal distension with probiotic

• Gawronska et al. Aliment Pharm Ther 2007
  – Randomized 37 patients with IBS
    • Lactobacillus GG vs placebo BID x 4 weeks
      • Pain relief 33% vs 5% in placebo (p = 0.04)
    • FAP or functional dyspepsia no benefit

Dietary interventions

• No conclusive evidence to support use in FAP and IBS
  – Further studies needed

• Can be considered on a case-by-case basis

Psychosocial interventions

• Include
  – Family therapy, cognitive–behavioral, guided imagery, relaxation, hypnotherapy, biofeedback

• Mechanism:
  – Direct effects on somatic symptoms
  – Promote ability to self-manage symptoms

• Meta-analyses
  – Effective in adults and children

Cognitive–Behavioral therapy

• CBT
  – Most common type employed
  – Interactions: thoughts, feelings, behaviors
    • Learn better coping skills
    • Identify triggers
    • Reduce maladaptive reactions

Guided imagery

• Specific form of relaxed focused concentration
  – Patients taught to imagine themselves in a peaceful scene
  – Create experience to avoid stress & anxiety

• Can be combined with other relaxation techniques
Pharmacotherapy

- Targets interactions between CNS, enteric nervous system & GI tract
  - Smooth muscle cells, peripheral neurotransmitter receptors, interneurons of spinal cord
  - Medications initially used to treat depression, anxiety & seizures

Antidepressants

- Most studied
  - Reduction in pain perception, improvement of mood/sleep patterns, modulation of GI tract
  - Adults
    - Tricyclic antidepressants, SSRIs beneficial in FGIDs
  - Children
    - Concerns ↑ suicidal thoughts & behavior
    - US FDA issued ‘black-box’ warnings in 2004

Antidepressants

- Additional side effects
  - Potential for cardiac arrhythmias
    - Prolonged QT syndrome
    - Baseline ECG recommended by American Heart Association (QTc < 450 msec)
  - Sedating
    - Given at bedtime
  - Starting dose
    - Amitriptyline: 0.2 mg/kg, increased to ~0.5 mg/kg

Antispasmodics

- Include:
  - Peppermint oil, hyoscyamine, dicyclomine
    - Decrease smooth muscle spasms in GI tract
- Adults
  - Meta-analysis: superior to placebo in IBS
- Peds: Kline et al. J Pediatr 2001
  - Randomized 42 children with IBS
    - Peppermint oil (187 or 374 mg) TID vs placebo x 2 weeks
      - 76% reported improvement vs 19% in placebo

Antispasmodics

- Hyoscyamine
  - Long-term use associated with anticholinergic side effects
    - Dry mouth, urine retention, blurred vision, tachycardia, drowsiness, constipation
- Hyoscyamine, dicyclomine
  - No studies for pediatric FAP or IBS
Cyproheptadine

- Classified
  - Antihistaminic, anticholinergic anti-serotonergic
  - Appetite stimulant
  - Used in abdominal migraine & cyclic vomiting

- Sadeghian et al. Minerva Pediatr 2008
  - 29 with FAP vs placebo x 2 weeks
    - 86% had improvement vs 35.7% in placebo group
    - Not confirmed with larger studies

Antimicrobials

- Mechanism:
  - Bacterial fermentation of undigested carbohydrates in small bowel bacterial leads to overgrowth
  - Neomycin & rifaximin, beneficial in adult IBS

  - Randomized 75 children to rifaximin or placebo
  - No difference after 10 days of treatment

Alternative therapies

- Why?
  - 36–41% with GI complaints use complementary & alternative medicine

- Include:
  - Acupuncture, chiropractics, homeopathy, herbal medicine, spiritual healing

- Be aware of common forms
  - Adverse effects or interactions
  - No evidence to support use in children

Key Issues

- Rule out major organic etiologies
- Diagnosis of functional GI disorders based on signs & symptoms
- Develop positive therapeutic alliance with patient/family
- Multidisciplinary & customized management
- Little data to support routine use of pharmacotherapy or dietary interventions

Thank You

Questions?