Pediatric (Chronic Recurrent) Abdominal Pain

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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\(^1,2\)
    • 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

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


Recurrent abdominal pain presentation

- Functional
- Organic

GI etiology
Non-GI etiology

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
### Functional GI disorders

**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, Pallor, 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

### Red Flags

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

### 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

### Organic GI disorders

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

• Classically
  – Crohn’s: 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>Antiretortysium 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>(80.7-95.1)</td>
<td>(86.3-93.1)</td>
<td>(-) in IgA deficiency</td>
</tr>
<tr>
<td>Deamidated gliadin IgG</td>
<td>(80.1-98.6)</td>
<td>(86.0-96.9)</td>
<td></td>
</tr>
</tbody>
</table>

*C Need to be on a gluten containing diet


Celiac disease

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

Imagining

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
Fiber

  – 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

• 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

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

Cognitive–Behavioral therapy

- Appears effective in children with chronic abdominal pain
  - Several studies incorporated multiple interventions

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

Antidepressants
• Bahar et al. J Pediatr 2008
  – 33 adolescents with IBS on amitriptyline
    • 10, 20 or 30 mg vs placebo x 8 weeks
      – ↑ QOL with amitriptyline, negative placebo effect

• Saps et al. Gastroenterology 2009
  – 83 with IBS, FAP, functional dyspepsia
    • 10 or 20 mg daily vs placebo x 4 weeks
      – Substantial improvement in both (63% vs 57.5%)
      – Amitriptyline group reduced anxiety scores
Antispasmodics

- Include:
  - Peppermint oil, hyoscymine, 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

- Hyoscymine
  - Long-term use associated with anticholinergic side effects
    - Dry mouth, urine retention, blurred vision, tachycardia, drowsiness, constipation
- Hyoscymine, 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 & rifaxamin, 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?