Functional Abdominal pain

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Disclosures

I have nothing to disclose.
Functional Abdominal Pain

• Objectives
  • Understand the mechanism
  • Identifying the patient with functional abdominal pain
  • Inform you of the available treatments
Functional Abdominal Pain
ROME III

• Continuous or nearly continuous abdominal pain
• No or only occasional relationship of the pain with physiologic events (eating, defecation, menses)
• Some loss of daily functioning
• The pain is not feigned
• Insufficient symptoms to meet the criteria for other functional gastrointestinal disorders (FGID)
• No inflammatory, infectious, anatomic or malignant conditions

*Criteria fulfilled for the last 3 months with symptoms onset at least 6 months prior to the diagnosis. ROME IV is coming
Functional Abdominal Pain

Rome IV Pediatric Functional Gastrointestinal Disorders – Disorders of Gut-Brain Interaction
Functional Abdominal Pain

- Inflammatory
  - Celiac disease, Inflammatory bowel disease, Eosinophilic Gastrointestinal disorder
  - GERD, NSAID induced

- Infectious
  - H Pylori, EBV infection, Giardiasis, Mesenteric Adenitis

- Anatomic
  - Cholelithiasis, Cholecystitis, Intestinal malrotation, Intestinal Duplications, Gastroparesis, Meckel's Diverticulitis

- Metabolic
  - Diabetes, Pancreatitis, Hypo/Hyperthyroidism

- Neoplastic
  - CNS, Lymphoma, Metastatic

Fever
Vomiting-blood +/- bile
Diarrhea
Unexplained weight loss
FTT
Pain associated with change in bodily function: urination, defecation, menstruation
Associated with eating
Localized Pain
Nocturnal Pain
Trauma associated
Functional Abdominal Pain Prevalence

- Male 29%
- Female 36%
- Average age 11.8y (8-15)
  - Boys 11.7
  - Girls 11.9
- Asian 42% (8%)
- Other 35% (16%)
- Caucasian 33% (21%)
- Latino 32% (22%)
- African-American 30% (33%)

Saps M et al., J Pediatr. 2009
Functional Abdominal Pain

• Account for 50% of consultations in a Pediatric Gastroenterology clinic
  • >90% no cause is found
• Account for 2-4% of visits to a General Pediatrics clinic
• 33-50% of patient will have symptoms in adulthood
• Low socio-economic status, parental GI complaints, single parent, and immigrant households
• More functional impairment and psychiatric symptoms

Starfield et al., Pediatrics 1984;74:991-7
Fig 2. Geographic distribution of functional abdominal pain in children, presented in pooled-prevalence rates.

http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0126982
Functional Abdominal Pain-Etiology Biopsychosocial Model

- Genetics and early life experiences
- Biologic and physiologic predisposition to symptoms development
- Stress-noxious stimuli
- Response(symptoms) are influenced by physical, environment and social exposures
Functional Abdominal Pain Stressors

- Psychological stress
- Inflammatory
- Sleep

- **Where?**
  1. Intestinal microbiome
  2. Mucosal Changes
  3. Enteric nervous system
  4. Primary afferents
  5. Genome
  6. CNS
Functional Abdominal Pain-Treatment

• Very few clinical trials in children

• Between 1955-2014 there were 8 randomized, controlled trials

• Disease Phenotype

• Mechanism of disease and medications were not well understood

• Targeting treatment was not easy because of the co-morbid symptoms

  • Koviac, et al. J Peds 2014
Co-morbid symptoms and FGID’s

- Dizziness - 90%
- Migraines - 90%
- Fatigue - 90%
- Nausea - 90%
- Sleep problems - 70-75%
- Fibromyalgia - 40-50%
- POTS - 30-40%

Functional Abdominal Pain Treatment

• AIM
  • To gain control of the symptoms and improve daily functioning rather than totally eliminate symptoms

• How
  • Mind-Body Connection (Brain-Gut Axis)
  • Pharmacologic Treatment
Functional Abdominal Pain Treatment

• Mind-Body connection
  Utilization of the brain's ability to influence the sensation of pain using Psychological treatments to relieve the pain

• Symptom diary-
  associations between emotion or events and pain

• Stress management-
  meditation and relaxation techniques allows one to focus attention on something besides the pain

• Hypnosis-
  positive changes can affect how you think or react

• Cognitive behavioral therapy-
  teaches how to change non-helpful thoughts, perceptions and behaviors to control symptoms
Functional Abdominal Pain Treatment
Pharmacologic

- Mild Pain without disability
  - Peppermint oil
  - Iberogast
  - Probiotics
  - PPI’s

- Pain with disability
  - TCAs (Amitriptyline)
  - SSRIs (Citalopram)
  - Gabapentin
  - Anti-spasmodic (hyoscymine, dicyclomine)
  - Cyproheptadine
  - Rifaximin
Functional Abdominal Pain-Treatment

• Amitriptyline
  • Study in Children
    • RCT in adolescents 8 weeks of 10, 20, 30 mg based on weight (n=33)
    • Improvement in QOL and pain over placebo
    • Negative placebo effect on pain
  • Mechanism
    • Inhibits Na channels, endogenous opioids, NMDA antagonist, anxiolytic
  • Dose
    • 0.1-2 mg/kg/day at bedtime
  • Side effects
    • Constipation, dry mouth, dizziness, somnolence

Bhar, RJ et al, J Pediatr. 2008
Functional Abdominal Pain-Treatment

• RCT using Amitriptyline in FGID (FAP, IBS, FD)
  
  • Dose: 10 mg if <35 kg, 20 mg >35 kg
  
  • No better than placebo in controlling pain
  
  • Reduced anxiety scores compared to placebo (p<0.0001)

Saps et al, Gastroenterology 2009
Functional Abdominal Pain-Treatment

- Citalopram-studies in children
  - Non-RCT and RCT
  - Better than placebo
  - 50% reduction pain scores at 4 week
  - Starting doses of 10-20 mg per day

- Campo JV et al., 2004
- Roohafza et al., Neurogastroenterol Motil. 2014
Functional Abdominal Pain-Treatment

- **Cyproheptadine** DB, PCT
  - Improvement (87%) vs. placebo (43%)
  - Improvement in self-reported change in frequency and duration of pain
  - Pain assessed at 1-2 weeks

- **Mechanism**
  - Antagonist of serotonin, histamine, muscarinic receptors, improved gastric accommodation though 5HT receptors?

- **Dose**
  - 0.25-0.5 mg/kg/day divided bid-tid

- **Side effects**
  - Weight gain, somnolence, irritability

Functional Abdominal Pain-Treatment

• **Gabapentin** - **No data in children**
  • Increases rectal compliance in adults with IBS-D
  • Attenuated rectal mechanosensitivity

• **Mechanism**
  • Binds alpha-2-delta-1 receptors of Ca channels in the CNS (spinal cord and PAG)

• **Dose**
  • 8-35 mg/kg/d divided TID (max 3600 mg)

• **Side effects**
  • Dizziness, somnolence, fatigue and ataxia

• Lee KJ et al, Aliment Pharmacol Ther. 2005
Rifaximin—double blind, placebo controlled in children with SIBO

No differences in pain in patients or placebo group

Mechanism
  • Alters the quantity, location and quality of the host intestinal microbiota

Dose
  • 550 mg

Functional Abdominal Pain-Treatment

• Complimentary and Supplementary therapies
  • Yoga/meditation
  • Herbs and diet supplements
  • Reflexology and massage
  • Acupuncture
  • Homeopathy

• 12% of non-clinical population seek these type of therapies for their children with pain

  • Barnes et al., 2008
Functional Abdominal Pain-Treatment

• Iberogast
  • 9 plant extracts: Chamomile flowers, bitter candytuft, angelica root, caraway fruits, milk thistle, lemon balm leaves, greater celandine, licorice root, and peppermint leaves

• Mechanism
  • Anti-hyperalgesia properties, improves gastric accommodation, and may have pro-secretory and anti-spasmodic

• Dose
  • 10 drops (1 ml) before each meal. Cost 100 ml for $32

• Side effects
  • Abdominal cramps, diarrhea, nausea, dizziness
Functional Abdominal Pain-Treatment

- Fludrocortisone
  - More likely to respond if symptoms are reproducible on a tilt table exam
  - **32% reduction in pain scores** \((p<0.006)\)
  - Dose
    - 0.5 mg daily and titrate as needed (0.1-0.2 mg/day adjustments)
  
- Fortunato et al.
Functional Abdominal Pain-Treatment

• Peppermint Capsules
  • RCT in children (n=42)
  • Reduction in abdominal pain severity in 75%

• Mechanism
  • Calcium channel blocker (anti-spasmodic)

• Dose
  • 30-45 kg-187 mg tid, >45 kg-374 mg tid
  • 1 cap=187 mg

• Side effects
  • Heartburn, headaches, flushing

  • Kline et al., J Pediatr. 2001
Functional Abdominal Pain-Treatment

• Exercise in Pain Control
  • Rat model
    • Increased B-endorphin and metenkephalin in the rostral ventral medulla (RVM) and periaqueductal grey matter (PAG)
    • Relieves thermal and tactile hypersensitivity
  • Adult IBS
    • Prospective, RCT, open label study of 12 weeks
    • 20-60 minutes of moderate to vigorous intensive physical activity 3 to 5 days per week
    • Improvement in IBS scores, physical and social functioning, emotion, sleep, and energy were significantly improved.

Stagg, NJ et al. Anesthesiology 2011
Johannesson et al., Am J Gastroenterology 2011
What do I do now?

• We have taken the history and completed our physical exam
• We have determined that there are no warning signs or symptoms
• If there are warning signals, has our evaluation ruled out any concerns?
• And we have determined that the patient meets the ROME III criteria for the diagnosis of Functional Abdominal Pain
Did I Remember to Ask the Most Important Question that will Dictate Therapy?

How many days of school or activities have you missed?

The answer determines whether the pain disabling?
Bottom-up Approach for Mild Abdominal Pain

Rehabilitation Program

- SSRI
- Gabapentin
- Amitriptyline
- Adjust school schedule
  (sleep, exercise, fluids)
- Rifaximin (for suspected SIBO)
- Cyproheptadine (follow weight)
- Peppermint oil
- Melatonin
- Iberogast
- PPI

Education and Reassurance
(sleep, exercise, fluids)

- Antispasmodic - situational pain
- Loperamide - situational diarrhea

Biofeedback / CBT
Worsening disability
Nausea, fatigue, disordered sleep, headaches, POTS

Miranda, A. Post-Grad Course. NASPGHAN, 2015
Top-down Approach for Disabled Patient

Rehabilitation Program

- Amitriptyline
- SSRI
- Gabapentin
- Adjust school Schedule
  (increase sleep, exercise, fluids)
- CoQ10 (fatigue)
- Melatonin (sleep)
- Proton Pump Inhibitor (dyspepsia)
- Fludrocortisone (orthostatic intolerance)
- Cyproheptadine (nausea and pain)
- Rifaximin (bloating and excess gas)
- Iberogast (nausea, pain, dyspepsia)

Biofeedback / CBT

Nausea, fatigue, disordered sleep, headaches, POTS

Miranda, A. Post-Grad Course. NASPGHAN, 2015
Conclusions

• Assess the level of decreased functioning or dysfunction

• Combination therapy is necessary in the severely disabled patient

• Psychological therapy is usually needed in all patients

• Encourage healthy lifestyles – sleep and behavior
Thank You!
Adolescent sleeping patterns in the last 20 years

Keyes et al., Pediatrics.2015