COMMON CAUSES OF CHRONIC ABDOMINAL PAIN

GILLIAN LAM, M.D.

ASSISTANT PROFESSOR OF PEDIATRICS

DIVISION OF GASTROENTEROLOGY

OHSU DOERNBECHER CHILDREN'S HOSPITAL

OCTOBER 23, 2020

DISCLOSURES

I have no financial or non-financial commercial relationships to disclose.

OVERVIEW

- Initial Work-up for Chronic Abdominal Pain
- Constipation
- Gastritis
- Celiac Disease
- Functional Abdominal Pain

INITIAL WORK-UP

- Constipation Treatment
- Empiric Trial of Acid Suppression
- Bloodwork: CBC, CMP, ESR, CRP, Total IgA/TTG IgA
- Stool Studies: Fecal calprotectin, Giardia, O&P, H.pylori

DIFFERENTIAL DIAGNOSIS: CONSTIPATION

Non-organic

- Developmental
  - Infant dyschezia
  - Cognitive
  - Attention-deficit disorders
- Situational
  - Toilet training
  - Toilet phobia
  - School bathroom avoidance
  - Sexual abuse
- Constitutional
  - Colonic inertia
  - Genetic predisposition
- Reduced stool volume and dryness
  - Low fiber in diet
  - Dehydration
  - Underfeeding or malnutrition

Organic

- Abnormalities of the colon and rectum
- Spinal cord lesions
- Neuropathic lesions
- Metabolic conditions
- Systemic disorders
- Drugs

ORGANIC CAUSES OF CONSTIPATION

Abnormalities of the colon and rectum

- Chronic intestinal pseudoobstruction
- Anal stenosis
- Anal/colonic stricture –post NEC/IBD
- Ectopic anus

Spinal cord lesions

- Spina bifida, Meningomyelocele
- Sacral agenesis
- Tethered cord
- Tumors

Neuropathic lesions

- Hirschsprung disease
- Intestinal neuronal dysplasia

Metabolic

- Hypothyroidism
- Hypo/hyper-calcemia
- Hypokalemia
- Uremia

Systemic disorders

- Celiac disease
- Cystic fibrosis
- Diabetes mellitus
- Autoimmune disorders
- MEN, pheochromocytoma
- Lead toxicity

Drugs

- Analgesics
- Anticholinergics
- Iron
- Antacids (esp Ca2+ containing)
- NSAIDs
- Psychotropics

TRIGGERS

- Diet changes – starting solids, switching to cow's milk (higher protein to carbohydrate ratio)
- Toddlers: toilet training and pattern of stool retention
- Older children: retentive pattern due to inconvenient or uncomfortable situations (i.e. school)

CONSTIPATION MEDICATIONS

Osmotic	Dose	Side Effects
Lactulose (70% solution)	1-3 ml/kg/day	Flatulence, abd cramps
Sorbitol (70% solution)	1-3 ml/kg/day	(same as lactulose)
Magnesium hydroxide	0.5-3 ml/kg/day	Hyper-Mg, hypo-phosp
Magnesium citrate	1-3 ml/kg/d (>6yo: 150ml/d)	Hyper-Mg, hypo-phosp
Polyethylene glycol	1-1.5 g/kg/day	---
Lubricant		
Mineral oil	1-3 ml/kg/day	Aspiration pneumonia
Stimulant		
Senna	2.5-7.5 ml/d (2-6 yo)	hepatitis, melanosis coli
Bisacodyl	5-10 mg/d	Abd pain/diarrhea, hypokalemia
Glycerin suppository	---	---

Evaluation and Treatment of Constipation in Infants and Children: Recommendations of NASPGHAN. JPGN. 2006.

THINGS TO CONSIDER

- Was there a Bowel Clean-out?
  - ”Reset”
- Is Bowel Regimen aggressive enough?
  - Aim for pasty stools
- Are they doing Bowel Retraining?
  - Regular toilet sitting

MEDICAL WORK-UP FOR CONSTIPATION

- History and physical exam
- Labs:
  - Serum Calcium
  - TSH/T4
  - Celiac panel
  - Lead level
  - CBC
- Lumbosacral MRI
- Barium Enema
- Anal Manometry

INITIAL WORK-UP

- Constipation Treatment
- Empiric Trial of Acid Suppression
- Bloodwork: CBC, CMP, ESR, CRP, Total IgA/TTG IgA
- Stool Studies: Fecal calprotectin, Giardia, O&P, H.pylori

GASTRITIS

- Nausea and/or Vomiting
- Poor appetite or Early satiety
- Gastroesophageal reflux
- Worse with or without food
- Worse with acidic, carbonated, spicy, caffeinated, greasy foods

- Empiric Trial of H2-Blocker Or Proton-Pump Inhibitor

GASTRITIS

- Stress, Post-viral, Medications (NSAIDs/Steroids)
- Causes often unknown

- H. pylori Testing
  - Screen with Stool Ag or Urea Breath Test
  - Gastric biopsies for Histology, CLO, culture
  - NASPGHAN recommends against antibody-based tests (IgG, IgA) for H pylori in blood, urine, and saliva – NO accurate/reliable

H. PYLORI TREATMENT

- Triple Therapy: Two Antibiotics + PPI
- Quadruple Therapy: Two Antibiotics + PPI + Bismuth

Drug	Bodyweight range	Morning dose, mg	Evening dose, mg
PPI*	15–24 kg	20	20
	25–34 kg	30	30
	>35 kg	40	40
Amoxicillin	15–24 kg	500	500
	25–34 kg	750	750
	>35 –kg	1000	1000
Clarithromycin	15–24 kg	250	250
	25–34 kg	500	250
	>35 kg	500	500
Metronidazole	15–24 kg	250	250
	25–34 kg	500	250†
	>35 kg	500	500
Bismuth‡	<10 years	262 QID	
	>10 years	524 QID	

INITIAL WORK-UP

- Constipation Treatment
- Empiric Trial of Acid Suppression
- Bloodwork: CBC, CMP, ESR, CRP, Total IgA/TTG IgA
- Stool Studies: Fecal calprotectin, Giardia, O&P, H.pylori

CELIAC DISEASE SCREENING

- Patients MUST be eating gluten for any celiac testing
- Bloodwork is only a SCREENING Test
- Diagnosis needs biopsies for confirmation
- Do NOT start gluten-free diet based on bloodwork results

CELIAC ANTIBODIES

	Sensitivity %	Specificity %
AGA IgG	69 – 85	73 – 90
AGA IgA	75 – 90	82 – 95
EMA - IgA	85 – 98	97 – 100
TTG IgA	*90 – 98*	*94 – 97*

- Always check Total IgA levels
- IgA deficient individuals will have false negatives
- Individuals with IgA deficiency (asymptomatic) are at increased risk for Celiac Disease

HIGH RISK POPULATIONS

- First degree relatives of individuals with celiac disease
- Autoimmune diseases:
  - Type 1 diabetes: 3-10%
  - Thyroiditis: 4-8%
  - Autoimmune hepatitis: 6-8%
  - Arthritis: 2-8%
- Genetic disorders:
  - Selective IgA deficiency: 7%
  - Down syndrome: 4-19%
  - Turner syndrome: 4-8%
  - Williams syndrome: 8%

CELIAC GENETIC TESTING

- HLA typing DQ2 and DQ8
  - DQ2 found in 90-95% of celiac patients, DQ8 in remainder
- Positive genetic testing is NOT very meaningful
  - 30% of general population ALSO have DQ2
  - Does NOT mean patient celiac disease, but are AT RISK of developing it anytime during their lifetime
- High negative predictive value
  - Negativity for DQ2/DQ8 excludes diagnosis of Celiac Disease with 99% confidence
  - MUST have genes to develop celiac disease
  - Can opt out of screening

ABDOMINAL PAIN: INITIAL WORK-UP

- Constipation Treatment
- Empiric Trial of Acid Suppression
- Bloodwork: CBC, CMP, ESR, CRP, Total IgA/TTG
- Stool Studies: Fecal calprotectin, Giardia, O&P, H.pylori

IBS VS IBD

- Screening for Inflammatory Bowel Disease
  - Fecal calprotectin or lactoferrin
  - ESR or CRP
- In a meta-analysis, patients with IBS symptoms , a CRP ≤0.5 and calprotectin level ≤40µg/g, there was a ≤1% probability of IBD
- Other Abnormal Labs
  - CBC: Elevated WBC and Elevated PLT
  - CMP: Low Albumin, Low Hgb
- Any Red Flags?

FUNCTIONAL GI DISORDERS

- Rome IV Criteria for Functional Gastrointestinal Disorders (FGID)
  - Duration >2 months
  - "After appropriate evaluation, the symptoms cannot be fully explained by another medical condition"
  - Symptom-based criteria

- Functional Nausea and Vomiting Disorders
- Functional Defecation Disorders
- Functional Abdominal Pain Disorders
  - Functional Dyspepsia
  - Irritable Bowel Syndrome
  - Abdominal Migraines
  - Functional Abdominal Pain – Not Otherwise Specified

FUNCTIONAL GI DISORDERS

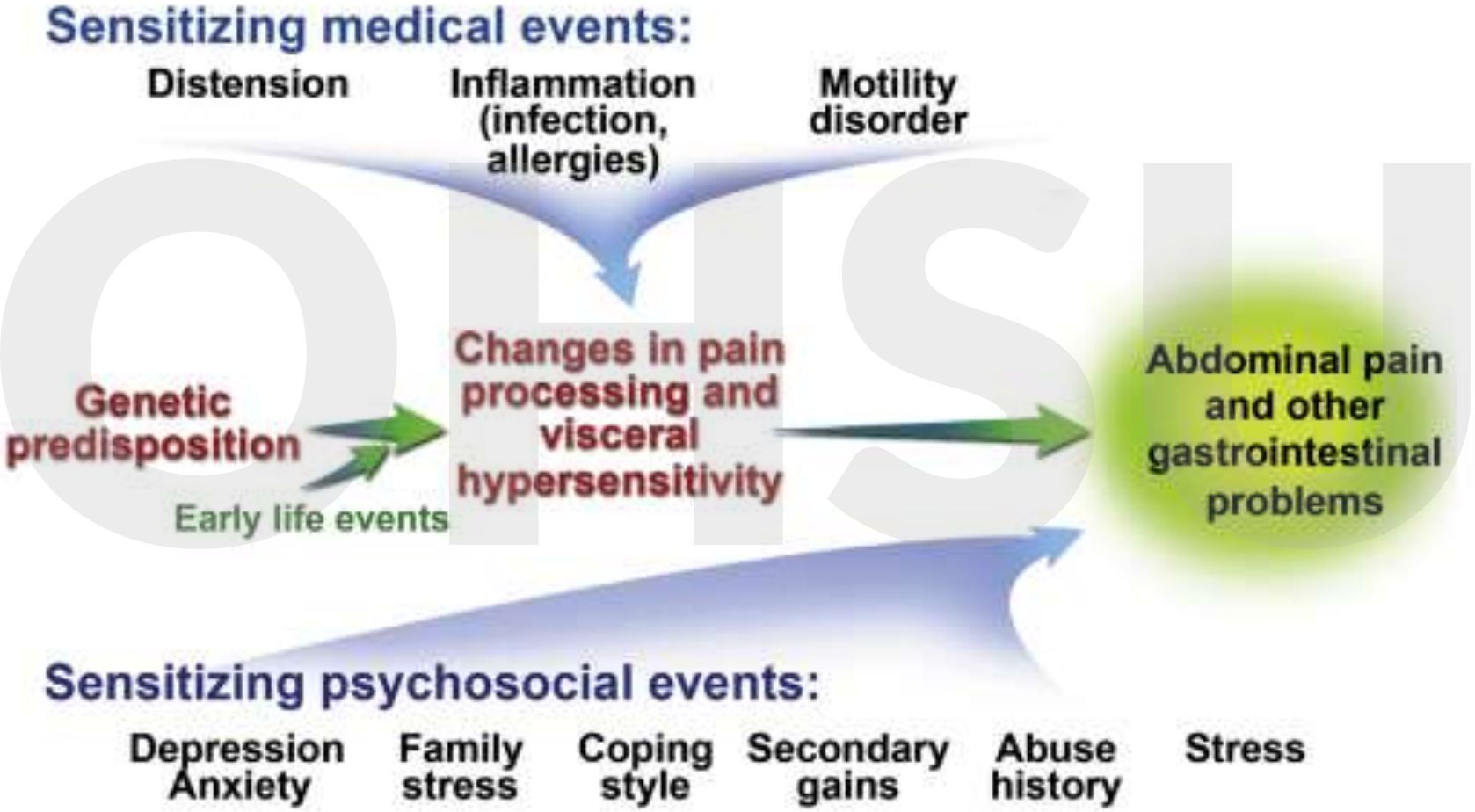
- Functional Dyspepsia. Have ≥ 1 of the following
  - Epigastric pain not associated with defecation
  - Postprandial fullness
  - Early satiation

- Irritable Bowel Syndrome
  - Abdominal pain at least 4 days/month with ≥ 1 of following:
    - Related to defecation
    - A change in frequency of stool
    - A change in form/appearance of stool
  - Does not resolve with resolution of constipation

FUNCTIONAL GI DISORDERS

- Abdominal Migraines. Include ≥ 2 of the following:
  - Acute episodes of abdominal pain lasting ≥ 1 hour
  - Pain is incapacitating and interferes with normal activities
  - Episodes are separated by weeks to months
  - Stereotypical pattern and symptoms
  - Pain is associated with ≥ 2 of the following:
    - Anorexia
    - Nausea
    - Vomiting
    - Headache
    - Photophobia
    - Pallor
- Functional Abdominal Pain NOS

FUNCTIONAL ABDOMINAL PAIN



TREATMENT

- Validate that symptoms are real
- Words to Avoid
  - “Non-organic” = They hear “Not real”
  - “Psychiatric”
  - “In your head”
  - “Making it up” or “Faking it”
- Reassurance that symptoms are not dangerous
- Encourage return to regular activities and return to school

TREATMENT – COGNITIVE/EMOTIONAL

- Biopsychosocial approach
- Address any underlying psychiatric illness
- Relaxation
- Family therapy
- Hypnotherapy
- Biofeedback
- Cognitive behavioral therapy

TREATMENT – DIETARY

- Low-FODMAP
  - **F**ermentable **O**ligosaccharides, **D**isaccharides, **M**onosaccharides, **A**nd **P**olyols
  - Sugars with poor absorption and rapid fermentation
- Fiber
  - Either too much or too little fiber
- Specific food elimination
  - Gluten
  - Lactose
  - Fructose
  - Personal Food Triggers

TREATMENT – COMPLEMENTARY

- Peppermint Oil / IBGard
- Probiotics
- Acupuncture
- Massage / Reflexology
- Yoga
- Placebo

TREATMENT – PHARMACOLOGIC

- Anti-cholinergics
  - Dicyclomine (Bentyl)
  - Hyoscyamine (Levsin)
  - Cyproheptadine (Periactin)

- Anti-depressants
  - SSRI's
  - Tricyclic antidepressant (TCA)
    - Amitriptyline - best studied in pediatrics
    - Lower dose than used for depression
    - EKG prior to TCA treatment to evaluate for long QT syndrome

TREATMENT SPECIFIC FOR ABDOMINAL MIGRAINES

- Similar to headache migraine therapy
- Abortive
  - Diphenhydramine (Benadryl)
  - Ondansetron (Zofran)
  - Sumatriptan (Imitrex)
- Prophylactic
  - Cyproheptadine
  - Amitriptyline
  - Propranolol

PROGNOSIS

- Expensive
  - Missed school/work
  - Unnecessary diagnostic tests
- Debilitating
  - Decreased quality of life
  - Anxiety, depression, sleep issues, headaches
- However, most children improve over time
- 1/3 of children with FGID may have IBS as adults

REFERENCES

- Bonilla, Saps. J Pediatr Gastroenterol Nutr. 2011 Dec;53 Suppl 2:S38-40.
- Croffie JM, Fitzgerald JF. Hypomotility disorders. In: Walker A, editor. Pediatric Gastrointestinal Disease. Fourth ed. Ontario: Decker Inc; 2004.
- Evaluation and Treatment of Constipation in Infants and Children: Recommendations of NASPGHAN. JPGN. 2006; 43: e1-e13.
- Kaukinen. Am J Gastroenterol 2002;97:695
- Jones NL, et al. Joint ESPGHAN/NASPGHAN Guidelines for the Management of Helicobacter pylori in Children and Adolescents (Update 2016). J Pediatr Gastroenterol Nutr. 2017.
- Loening-Baucke V. Constipation and Fecal Incontinence. Pediatric Gastrointestinal and Liver Disease. Fourth ed. Philadelphia: Saunders; 2011.
- Magge, Lembo. Gastroenterol and Hepatol. 2012. 8(11):739-45.
- Menees SB, Powell C, et al. A meta-analysis of the utility of C-reactive protein, erythrocyte sedimentation rate, fecal calprotectin, and fecal lactoferrin to exclude inflammatory bowel disease in adults with IBS. Am J Gastroenterol. 2015;110(3):444
- Rasquin A, Di Lorenzo C, et al. Childhood functional gastrointestinal disorders: child/adolescent. Gastroenterology. 2006 Apr;130(5):1527-37.
- Whitfield, Shulman. Pediatr Ann. 2009;38(5):288–94.
- Schuppan. Gastroenterology 2000;119:234