# Chronic Diarrhea

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# case

- A 15 year old boy with presents with 3 months of non-bloody loose stool 5-15 times/day and diffuse abdominal pain , no acceptable weight gain and weight loss approximately 5 kg

- At onset of illness:

- occult blood in stool
- stool calprotectin (a measure of inflammation in the colon) mildly positive
- Negative stool WBC
- Negative stool culture
- Negative C. difficile
- Negative ova & parasite study
- Negative giardia antigen
- Normal CBC with diff, Complete metabolic panel, CRP, ESR

# Case - History

- Non-bloody diarrhea and abdominal pain continues
- No relation to food
- No fevers
- weight loss
- No good appetite
- No night time occurrences
- No sick contacts

# Case - Therapies Without Benefit

- Diet modifications
- 2 week lactose free diet
- “Specific Carbohydrate Diet” with poor compliance
- Medications
- Metronidazole trial for several courses
- Nitazoxanide trial (antiprotozoal)
- Loperamide trial • Probiotics

# How to approach this case?

- Definition of Chronic Diarrhea

• > 2 weeks

• Stool output > 10cc/kg/day (or >200mL/day for adults)

• Practical definition: increase in frequency, increased water content compared to previous pattern for individual

• Occurs in about 1 case per 5 person-years in infants and young children

# Pathophysiology: Osmotic Diarrhea

- Defect :1. Maldigestion 2. Transport defects 3. Ingestion of unabsorbable solute
- Stool Exam :1. watery 2. pH < 5.5 3. + reducing substances 4. increased osmolality 5. elevated osmotic gap > 100 [stool osmolar gap: 290 – 2 x (stool Na + stool K)]
- Examples :1. Lactase deficiency 2. Glucose-galactose malabsorption 3. Lactulose use 4. Laxative abuse 5. Polyethylene glycol (Miralax) use
- Stops with fasting; increased breath hydrogen with carbohydrate malabsorption; no stool leukocytes

# Pathophysiology: Secretory Diarrhea

- Defect :1. Decreased absorption 2. Increased secretion 3. Electrolyte transport
- Stool Exam: 1. Watery 2. normal stool osmolality 3. Stool osmotic gap < 100 [stool osmolar gap: 290 – 2 x (stool Na + stool K)]
- Examples: 1. Carcinoid 2. VIP 3. Neuroblastoma 4. Congenital chloride diarrhea
- Comment :Persists during fasting; bile salt malabsorption also may increase intestinal water secretion

# Pathophysiology: Increased motility

- Defect :1. Decreased transit time
- Stool Exam :1. loose to normal-appearing stool 2. normal pH and osmolality 3. stimulated by gastrocolic reflex
- Examples: 1. Irritable bowel syndrome 2. Thyrotoxicosis
- Comments: Infection also may contribute to increased motility

# Pathophysiology: Decreased motility

- Defect :1. Defect in neuromuscular units 2. Stasis (bacterial overgrowth)
- Stool Exam :1. Loose to normal appearing stool 2. Normal or abnormal pH and osmolality
- Examples :1. Blind loop syndrome
- Comment: Possible bacterial overgrowth

# Pathophysiology: Decreased surface area (osmotic and motility)

- Defect :1. Decreased functional capacity
- Stool Exam: 1. Watery
- Examples: 1. Short bowel syndrome 2. Celiac disease 3. Rotavirus enteritis
- Comments: May require elemental diet plus parenteral alimentation

# Pathophysiology: Mucosal irritation

- Defect :1. Inflammation 2. Decreased colonic reabsorption 3. Increased motility
- Stool Exam: 1. Blood and increased WBCs in stool
- Examples :1. Acute bacterial enteritis 2. Inflammatory bowel disease
- Comments: Mucosal invasion??

# Differential Diagnosis

- Pancreatic Insufficiency:
- Clinical Presentation & Evaluation

• Greasy, foul smelling stool

• Most common is Cystic Fibrosis

– Picked up on newborn screen usually

– sweat test is screening test for CF

• Evaluation

– Fecal fat (72 hour fecal fat is not practical but better test)

– Stool elastase (surrogate marker for pancreatic insufficiency)

_Abdominal xray

# Celiac Disease

- Clinical Presentation & Evaluation:
- Variable presentation

• Evaluation

– Screen with Celiac serologies

• Tissue transglutaminase

– Confirm with upper endoscopy biopsies

# Irritable Bowel Syndrome

- Constellation of symptoms including abdominal pain and changes in bowel habits

• Diagnosis of exclusion although do not need to perform every test to diagnose IBS

• A positive family history is frequently seen

• Explore inciting psychological factors/stressors

# Inflammatory Bowel Disease

- General Clinical Characteristics :- Weight loss, abdominal pain, diarrhea – Peri-anal involvement - anal tags/fistula (Crohn's) – Positive Family history
- Laboratory findings – Anemia, Hypoalbuminemiaa, elevated CRP and ESR
- Evaluation – Upper endoscopy and colonoscopy for diagnosis – Small bowel imaging with MRI or small bowel follow through
- Treatment – Anti-inflammatory medication – Immunosuppressants – Biologics – Surgery

# Additional Differential Diagnosis

- Giardia
- Cryptosporidiosis
- C. difficile colitis
- Food allergy
- Bacterial overgrowth
- Disaccharidase deficiency
- Overflow encopresis secondary to severe constipation
- Iatrogenic
- Factitious

# Summary

- Practical definition: ↑ looseness & ↑ frequency of stool above “normal” for patient for > 2 weeks
- Causes in children include: – Functional – Infectious – inherited disorders of immune regulation, macronutrient digestion, mucosal barrier function, and transport
- High proportion are functional in all age groups
- Celiac disease is relatively common, and should be considered since it can present with minimal symptoms

# Case – Work-up

- Labs

• Fecal occult blood, stool calprotectin, stool WBC, stool culture, stool O&P, stool giardia all negative

• Repeat CBC, CMP, CRP, ESR negative

• Skin testing for food allergies – negative

TTg IgA: Positive

Esophagogastroduodenoscopy and colonoscopy compatible with malabsorption syndrome

Pathology: Marsh 3

# Case patient

- Celiac disease
- Treated by Gluten free diet