Board Review 2019

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Small Bowel

Disclosure

- none

Malabsorption

- Can occur at different phases
  - Luminal phase
    - Contact between ingested food and digestive enzymes
      - Example: pancreatic insufficiency
  - Mucosal phase
    - Substances are assimilated and absorbed in the required constituent form
      - Example: celiac disease, crohns
  - Delivery phase
    - Nutrients are taken up into the cytoplasm and transported to the lymphatic or portal venous system
      - Example: lymphoma

Diarrhea

- Mechanism:
  - Decreased absorption
    - A villous function
  - Increased secretion
    - A crypt function

Small bowel case

- A 36 y/o female presents with an 8-week history of recurrent watery, non-bloody diarrhea. Routine lab, endoscopic and infectious evaluation thus far has not revealed a diagnosis. Which of the following values suggest a secretory diarrheal etiology?

a. Stool osmolality <290mOsm/kg
b. Stool osmolality >290mOsm/kg
c. Stool osmotic gap <50mOsm/kg
d. Stool osmotic gap >125mOsm/kg
e. Stool pH <5.3

Answer: c
Stool studies in chronic diarrhea

- Stool osmolality <290 mOsm/kg
  - Likely contaminate with water or urine
- Osmotic diarrheas are indicated by large stool osmotic gap, at least >50mOsm/kg
  - Greater specificity for osmotic gaps of >100mOsm/kg
- Secretory diarrheas are associated with a low osmotic gap, <50mOsm/kg
- Carbohydrate malabsorption is marked by a stool pH<5.3
  - Calculation 290- 2(stool Na + stool K)

Diarrhea: Categories

-abdominal pain, fever, tenesmus

-stools mucoid, bloody, smaller volume

-blood and leukocytes microscopically

- Tend to produce watery diarrhea
- No fever or gross bleeding
- Stool appears normal on microscopy

Inflammatory

Noninflammatory

Diarrhea: Categories

- small and/or large-intestinal fluid and electrolyte secretion
- Stop with fasting:NO
- Stool osmotic gap: <50mOsm/kg

Secretory

- Ingestion of poorly absorbed cations, anions, sugars, or sugar alcohols
- Stop with fasting: YES
- Stools osmotic gap: >100mOsm/kg

Osmotic

Small bowel case

- A 34 y/o woman presents with a 8-month history of bloating and abdominal pain relieved after a BM. She tends towards constipation. She has history of dysmenorrhea, and a sister with dermatitis herpetiformis. She denies travel, alcohol use or wt loss. Laboratory studies demonstrate mild iron def anemia. Tissue transglutaminase antibody is negative.
- The next best step in the evaluation should be:

Next step:

a. Start Dicyclomine
b. Diagnostic laparoscopy
c. Small bowel biopsies
d. Anti-gliadin antibody

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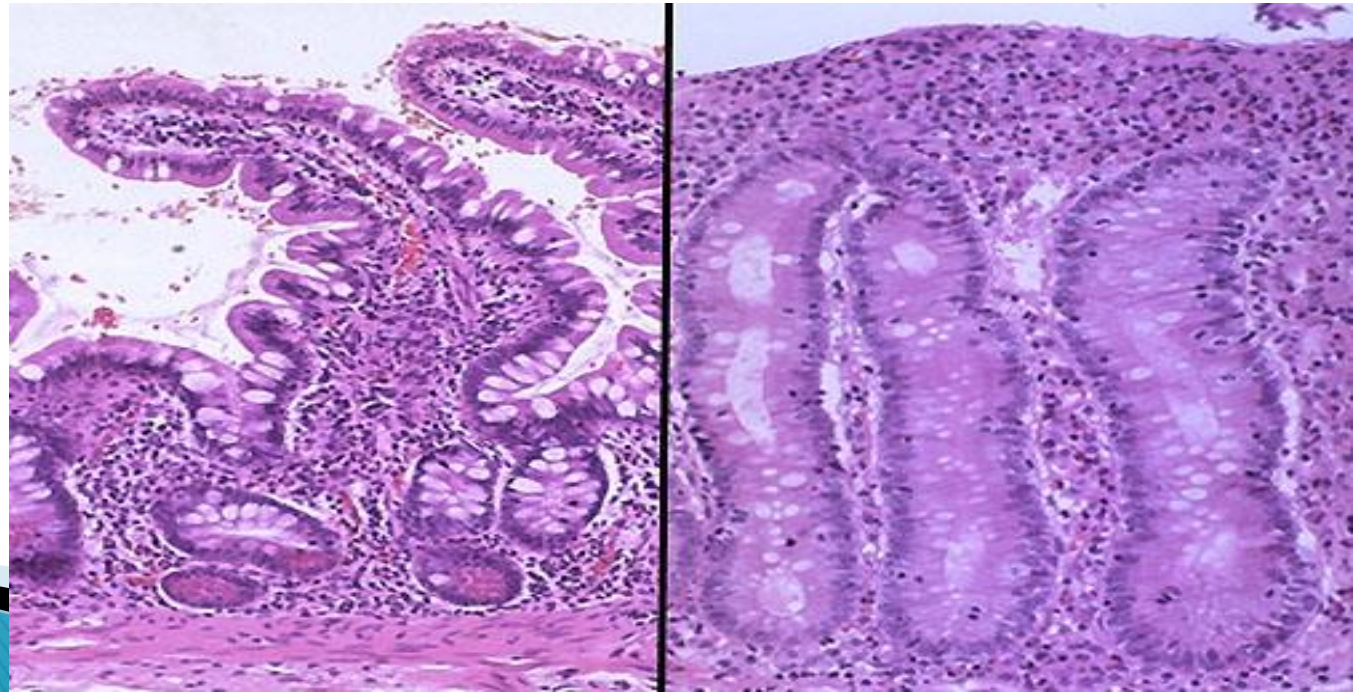
Celiac (CD) and Dermatitis Herpetiformis (DH)

- Up to 10% of DH will have family member with gluten-related enteropathy
- GI sxs of CD range constipation→diarrhea
  - Many meet Rome criteria for IBS
- IDA the sole manifestation in some; commonly overlooked in menstruating females
- All symptomatic family members of someone with a gluten-related enteropathy should have small bowel biopsies in addition to serologic screening.

Celiac disease “gluten enteropathy”

- genetically inherited associated with the HLA locus found on the short arm of **chromosome 6.** HLA-DQ2 is present in 95% of patients.
- pathology: flattening of the small bowel villi.



Classic disease

- 3 features
  - Villous atrophy
  - Symptoms of malabsorption
  - Resolution of mucosal lesions and symptoms upon withdrawal of gluten-containing foods.

Small bowel case

- 58 y/o male presents with diarrhea. His evaluation is positive for TTG. He underwent an EGD with small bowel bx which was consistent with celiac. Colonoscopy normal.
- Lab: Hgb 11 (MCV 72), ferritin 12, alk Phos 2-fold elevation. Normal AST, ALT,Bilirubin, GGT. Fasting glucose 104
- Which of the following additional tests would you recommend at this time?

Additional tests?

a. Liver biopsy
b. MRCP
c. Bone marrow biopsy
d. 25-hydroxy vitamin D

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Bone disease and Celiac

- A leading cause of morbidity in pts with celiac
  - Calcium malabsorption (osteopenia, osteoporosis)
  - Vitamin D malabsorption (osteomalacia)
- Lab feature of osteomalacia is elevated alkaline phosphatase
  - Bone fraction
- Bone density should be done in all newly diagnosed patients

Celiac diagnosis

- All diagnostic serologic testing should be done with pts on gluten containing diet.

  (Strong recommendation, high level of evidence)ACG.

Celiac diagnosis

- Biopsies should be performed in all pts who are suspected of having celiac, regardless of serologic evidence
  - Small # of people have + serology but normal biopsies
  - Negative serology does not preclude presence of disease

Diagnosis- screening tests

- Antigliadin antibody (AGA)
  - IgG good sensitivity (83-100%)
    - False + in cow milk protein intolerance and parasite infection.
  - IgA good specificity (72-100%)
- Antiendomysial antibody (AEA or EMA)
  - False - in IgA deficiency and kids <2 years.
  - Sensitivity 97-100%; specificity 98-99%

Diagnosis- Screening Tests

- **Tissue transglutaminase Ab (IgA)**
  - Single preferred test (for over age 2)

sensitivity 90-100%

specificity 95-100%

(**Strong recommendation, high level of evidence**) ACG.

**check IgA

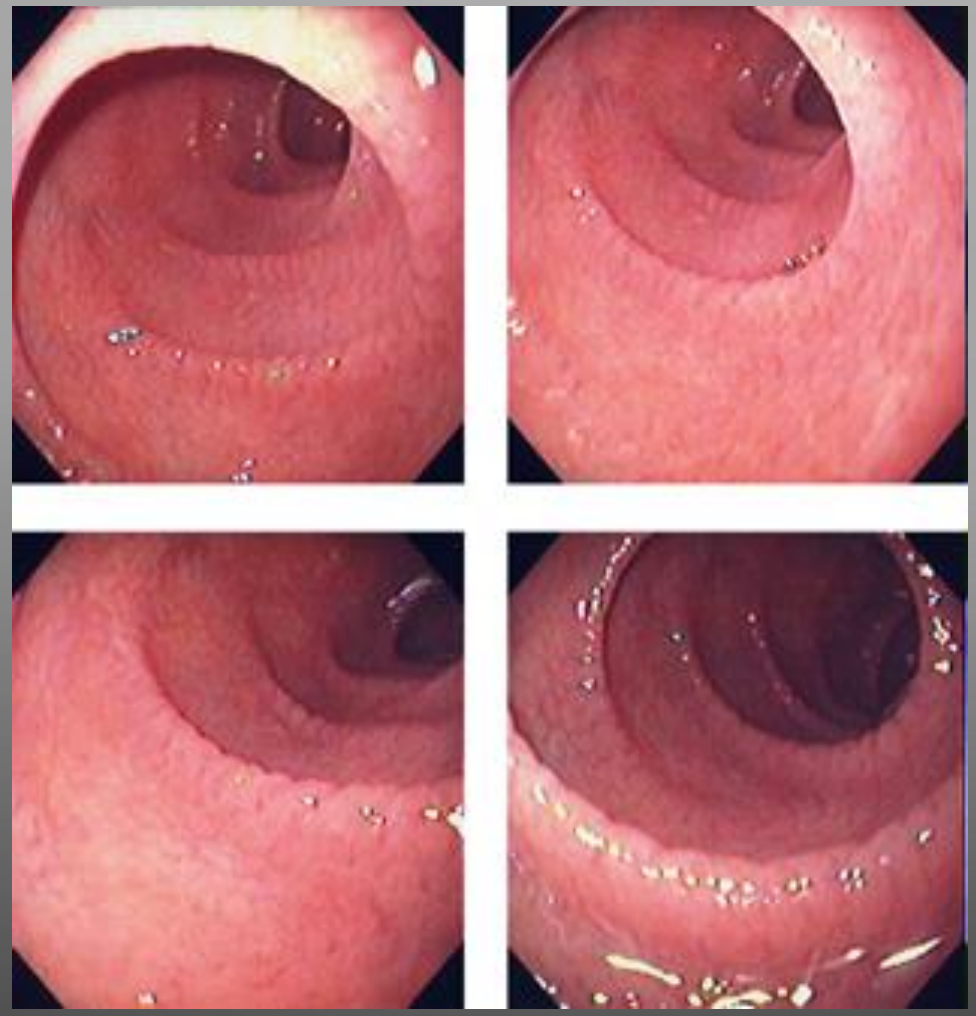
(or include both IgA and IgG-based test)

Small Bowel Biopsies

- + serology
- High probability of celiac
  - Biopsies from:
    - Duodenal bulb
    - 2nd and 3rd portion duodenum
  - If the suspicion of CD is high, intestinal biopsy should be pursued even if serologies are negative (**Strong recommendation, moderate level of evidence**).

Classic endoscopic appearance

- Scalloping
- Nodularity
- Absence of circular folds (small intestine plicae)



Small bowel question

- Pt with celiac has followed a gluten free diet for 6 months and was doing well but now diarrhea has returned. Review of her diet shows compliance. Endomysial antibody testing is now normal. What is the next step?

a. Repeat small bowel biopsy
b. SBFT
c. CT scan of abdomen
d. Colonoscopy with biopsies
e. Bacterial aspirate if small bowel contents

Answer: d colonoscopy

- Pt had responded to gluten-free diet
- Common cause of recurrent diarrhea is **microscopic colitis**, detected with random biopsies in a normal appearing colon.
- About 15% of time the 2 diseases coexist.

Small bowel Question

- 52 y/o male recently traveled to Puerto Rico for 3 months. He developed fatigue, malaise and abdominal cramps 1 week after returning, followed by diarrhea and dyspepsia. Stools are “oatmeal-like”. Lab Hgb 11.3 with MCV 103. Stool studies neg. Enteroscopy is performed. Likely diagnosis?
  a. Celiac sprue
  b. Giardia
  c. Tropical sprue
  d. Lactase def.

Answer: c tropical sprue

- Can mimic celiac sprue.
- Etiology unknown although it is suspected to be infectious.
- Tx: Tetracycline 250mg QID and Folate 5mg daily for 6-12 months

KEY:

Diarrhea+ tropics+ macrocytic anemia = Tropical sprue

Small bowel case

- 45 y/o female with a history of systemic scleroderma presents with 6 months of diarrhea. She denies any other GI symptoms. EGD and colonoscopy with biopsies are unrevealing. Stool infectious studies are negative. SBFT reveals jejunal diverticulum. The next best test is:
  a. Gastric emptying test
  b. Glucose breath test
  c. *H.pylori* breath test
  d. Push enteroscopy

Bacterial Overgrowth

- A direct consequence of the presence of increased amounts of colonic-type bacterial flora in the small intestine.
- Can result in fat, carbohydrate, and protein malabsorption
- Macrocytic anemia→ cobalamin def.

Bacterial Overgrowth Etiology

- Small bowel diverticula
- Fistulas from crohn's
- Bypass of intestine
  - Jejunoileal for obesity
- Functional stasis
  - Scleroderma
  - Diabetes

Case answer

- 45 y/o female with a history of systemic scleroderma presents with 6 months of diarrhea. She denies any other GI symptoms. EGD and colonoscopy with biopsies are unrevealing. Stool infectious studies are negative. SBFT reveals jejunal diverticuli. The next best test is:
  a. Gastric emptying test
  b. Glucose breath test
  c. *H.pylori* breath test
  d. Push enteroscopy

Bacterial Overgrowth diagnosis

- Direct aspiration of aerobes and anaerobes from small bowel is the standard.
- Alternatives: carbon dioxide and hydrogen breath tests.

Therapy: If the cause is not correctable, can trial antibiotics. largely empiric

Small bowel case

- A 34 y/o female presents with a 5 yr history of quiescent Crohn's disease of the terminal ileum. Small bowel barium studies show nodularity, spiculation, and mild luminal narrowing of 10cm of terminal ileum. You decide to screen for nutritional deficiencies. A deficiency of which of the following nutrients is most likely in this case?

Nutritional def in crohns

a. Vitamin A
b. Vitamin D
c. Vitamin E
d. Iron
e. Vitamin B12

Nutritional def in crohns-answers

a. Vitamin A
b. Vitamin D
c. Vitamin E
d. Iron
e. Vitamin B12

Nutritional def in crohns

- Pts are susceptible to deficiencies in all the nutrients listed.
- Longer segments of TI or resection predispose to bile acid depletion and fat soluble vitamin malabsorption (A,D,E,K)
- If the reduction in distal ileal mucosal length is sufficient, Vit B12 malabsortion becomes possible.
- In all pts, iron deficiency is most common from chronic blood loss.

Small bowel case

- A 44 y/o male with a history of short bowel syndrome presents to the office with complaints of a scaly red rash on his face, groin, and hands with progressive alopecia. What is the most likely etiology?

a. Vitamin B12 def
b. Copper def
c. Zinc def
d. Vitamin D def
e. Vitamin E def

Answer: c zinc deficiency

- Can occur with short gut syndrome
  - Malabsorption
- Characteristics:
  - Alopecia
  - Loss of taste
  - Poor wound healing
  - Scaly rash

Small bowel case

- A 76 y/o female presents with glossitis, paresthesias, anorexia, and diarrhea.
- Lab: hgb 10.6g/dL, MCV 108fL and a normal folic acid.
- Which of the following is the most likely underlying cause of her symptoms and her anemia?

a. Achlorhydria
b. Zinc deficiency
c. Small bowel angioectasias
d. Carcinoid syndrome

Answer: a

- Pt presents with Vit B12 deficiency
  - Megaloblastic anemia
  - B12 found in animal products such as eggs, meat and milk
  - Common symptoms: glossitis, anorexia, diarrhea and paresthesias due to degeneration of the dorsal columns in the spinal cord leading to decreased vibratory and proprioceptive sensation.
- Achlorhydria and pernicious anemia are a common cause of Vit B12 def in the elderly.

Small bowel case

- A 43 y/o woman presents to the office following bariatric surgery 3 months ago with complaints of peripheral neuropathy, muscle weakness, ataxia and confusion. Her post-surgical course was complicated by frequent nausea with vomiting. Which of the following is the most likely explanation of her symptoms?

a. Folic acid deficiency
b. Vitamin B6 deficiency
c. Vitamin C deficiency
d. Vitamin B1 deficiency

Answer: d

- Thiamine deficiency following gastric bypass is relatively common, particularly among patients with significant post-op vomiting and is sometimes referred to as bariatric beriberi.

- Screening for thiamine def is recommended at baseline, at 6 months and annually following bariatric surgery.

Giardia

- Intestinal tract infection caused by protozoal parasite *Giardia lamblia.*
- Predominant age in US:
  - Preschool; especially daycare
  - Homosexual men
- Contaminates fresh water sources worldwide
    - (mountain streams)

Giardia cont.

- Clinical findings:
  - 70% have intestinal symptoms
    - Diarrhea
    - Flatulence
    - Cramps
    - Bloating
    - Nausea
  - Chronic diarrhea, malabsorption, and weight loss
  - 20-25% of infected pts are asymptomatic

Workup

- Stool
  - Immunoassays for Giardia antigen routinely used in labs
- R/O malabsorption
  - B12
  - Albumin
  - Stool fat test
- Tx:
  - Metronidazole, Nitazoxanide, Paromomycin

Small Bowel

45 y/o has had malabsorption for the last year with low volume diarrhea, polyarthralgias, and occasional visual hallucinations. PE is neg. CT shows generalized lymphadenopathy. EGD shows broad flattened villi in the duodenum. Bx show numerous PAS + macrophages in the submucosa. Which therapy may be useful for this pt?

a. Gluten free diet
b. Steroids
c. Antibiotics
d. Antacids

Answer: c antibiotics

- Whipples disease
  - *Tropherma whippelii*
  - Rare infectious condition that prevents small bowel from absorbing nutrients
  - Can affect multiple organs
  - May get a description of “foamy macrophages”
- Most common sx: arthralgias, weight loss, recurrent abd pain, diarrhea. CNS manifestations also classic

Thank You
Good Luck!