Disorders of the Gastrointestinal System

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Class 12 Objectives

• Upon completion of this lesson, the student will be able to
  – list the pathologies associated with GI motility.
  – determine the infectious agents associated with GI disorders.
  – predict those at risk for GI bleeding and the S & S these individuals could present.
Pathologies of GI Motility

- **Diarrhea**
  - Is an > in frequency, fluid, and / or volume of stool
    - Osmotic: the presence of nonabsorbable substances in the intestine causing water to be drawn into the lumen by osmosis
      - sorbitol-containing liquid medications; tube feedings
      - lactose intolerance
    - Secretory: excessive mucosal secretion of fluid & electrolytes
      - related to: gastroenteritis (E. Coli), rotavirus, laxative abuse, hyponatremia, fecal impaction

- **Motile**: > motility is d/t stimulation caused by inflammation or obstruction
  - resection of small intestine, fecal impaction, early bowel obstruction (e.g. Bezor)

- **Clinical Manifestations**:
  - crampy abdominal pain, > bowel sounds
  - prolonged diarrhea leads to F & E imbalances and dehydration
  - infants & elderly are at risk: check hydration & F/E status

Case Study

- A 72 year-old woman, who lives alone, has a history of laxative abuse. What type of diarrhea is she at risk for? What type of fluid imbalance is she at risk for?
- What would you expect her VS to be?
- Her electrolytes upon admission to the hospital are: Na+ = 155; K+ = 3.5; Cl- = 116; Hct = 45%
- Clinical manifestations? Treatment?
- Which acid-base disturbance is she at risk for? Why?
Pathologies of GI Motility

**Constipation**
- Infrequent or difficult defecation
  - most frequently c/o digestive disorder
- **Etiology:** functional disorder of bowel motility
  - incidence is > in the elderly; diet poor in fiber & fluids; anatomic lesions; drug therapy
  - d/t poor neural stimulation of GI motility, abdominal muscle weakness, bowel obstruction
  - Mega colon, opiates, hypothyroidism, diabetic neuropathy, sedentary lifestyle, low residue diet

**Pathologies of GI Motility**

**GERD**
- Reflux of gastric contents into lower esophagus resulting in clinical symptoms or structural alterations in the esophageal tissues (reflux esophagitis)
- 94% of the individuals have hiatal hernias
  - a protrusion of some part of the upper portion of stomach through esophageal hiatus and then into the thoracic cavity

**GERD**
- Delayed gastric emptying is seen primarily in:
  - diabetics, cigarette smokers, and ETOH abuse
  - dysphagia, eructation, heartburn, GI bleeding, abdominal discomfort when lying down, dyspnea may be present
  - Heartburn, ulcerations, precancerous lesions
Fecal Incontinence

- Inadequate control of defecation in an adult due to weak pelvic floor muscles and/or weakness of the external anal sphincter
- Common causes:
  - *Clostridium difficile* responsible for nosocomial diarrhea
  - Impaction, laxative abuse, hyperosmolar tube feedings
- Risk factors: older persons in long-term care institutions (Bliss, et al., 2000)

Intestinal Obstructions

- **Large Bowel**
  - A large bowel obstruction is an emergency condition that requires early & prompt surgical intervention
  - Etiology:
    - infectious / inflammatory, neoplastic, or mechanical pathology (colorectal cancer)
  - Rotation or twisting of the cecum or sigmoid colon will cause abrupt onset of symptoms
  - Immediate abdominal distention
    - Decreases the ability to absorb F & E

- **Sigmoid volvulus**: usually seen in the older individual with a hx of straining at stool
- **Symptoms**: abdominal distention, nausea, vomiting, and crampy abdominal pain; check history of flatus and BMs
- **Abrupt onset is indicative of an acute obstruction**
  - Sudden onset due to “torsion or hernia?”
- **A chronic hx of constipation is related to a dx of diverticulitis or carcinoma**
- **Obstipation (no flatus or BM) & loss of weight = carcinoma**
Intestinal Obstructions

- **Paralytic ileus** or “silent bowel” is most often seen after abdominal surgery & anesthesia
  - bowel activity is < d/t lack of neural stimuli (“functional”)
  - this can lead to “mechanical” obstruction d/t accumulation of feces
- **Hernias**: a loop of bowel protrudes through abdominal wall
  - inguinal canal, umbilicus, or incisional scar tissue
  - caused by heavy lifting, straining, or coughing

Disorders of GI Bleeding

- **Upper**: includes the esophagus, stomach, duodenum
  - peptic ulcer disease (PUD) or esophageal varices
- **Lower**: includes the jejunum, ileum, colon, rectum
  - colorectal cancer, polyps, hemorrhoids, IBD

**Manifestations**:
- hematemesis
- bright red blood in the stool (“hematochezia”)
- black, dark, tarry stools (“melena”)
- “occult” bleeding (invisible blood in the stool)

**Tx**: find the underlying cause; fluid volume replacement; endoscopy or colonoscopy; medical and/or surgical tx

Disorders of GI Bleeding

**Results**
- Shock will ensue if massive (25% EBL within hours) bleeding occurs
- Metabolic acidosis, prerenal failure, bowel infarction will occur
- < coronary & cerebral blood flow
- Death
  - See McCance, Figure 38-1, p. 1265
Peptic Ulcer Disease

- An inflammatory disorder causing deep erosion of stomach or duodenal mucosa by HCL & pepsin
- At risk: infection with H. pylori; > NSAIDS; > secretion of HCL as seen in Zollinger-Ellison syndrome
- Etiology: age, family hx
  - > mucolytic enzymes; may lead to pyloric obstruction, bowel perforation and ultimately peritonitis
- Sx: hallmark sign = upper gastric pain
  - Emergency: hematemesis, melena, occult blood, shock

Peptic Ulcer Disease

- Treatment includes:
  - < ETOH intake
  - screen for H. pylori (C-urea breath test)
  - frequent small meals
  - avoid calcium based antacids d/t > gastrin release
  - H2 blockers (Tagamet & Zantac)
  - Insert NG tube for severe bleeding and gastric lavage

Gastric, Duodenal, Stress Ulcers

- **Gastric**
  - > cancer risk
  - Lack of remission or exacerbation periods

- **Duodenal**
  - Younger age at onset
  - Strong familial history
  - Ulcerogenic drugs used
  - Nocturnal pain more prevalent

- **Stress**
  - Systemic trauma, severe illness, neural injury
Intestinal Bowel Disorders

• Ulcerative Colitis
  – A disease that causes inflammation and sores in the lining of the large intestine.

• Crohn’s Disease
  – A disease that causes inflammation in the small intestine, but it may affect any part of the GI tract.
  – Smoking, diet, and/or immune response to bacteria

Gastric Cancer

• Adenocarcinoma is the primary malignant neoplasm
  • 8th leading cause of mortality r/t cancer in US
  • Epidemiology: 55-60 year olds; 2 times greater incidence in men vs. women
  • Risk factors: H. pylori, < socioeconomic class, consumption of pickled foods, improper food storage, radiation exposure
  • Etiology: chronic inflammation, dietary influences, genetic & environmental factors

Gastric Cancer

• Sx: Vague early sx with weight loss; indigestion; abdominal distention; mild pain induced with or without food; chronic blood loss leads to anemia; occult blood in stool
• Tx: reduce risk factors; total or partial gastrectomy; lymph node resection; chemotherapy & radiation
• 15% of cases lend a 5-year survival rate
Colorectal Cancer

- “Patients with long-standing ulcerative colitis have been shown to be at increased risk of developing colorectal cancer” (Medscape, 1999)
- Involves a primary malignant tumor of the rectum or colon
  - 2nd leading cause of cancer death in US
  - > incidence in 50 year olds
  - > fat and poor fiber diet; > ETOH consumption; cigarette smoking; obesity; sedentary life style
- Exact etiology unknown…> incidence with polyps

Colorectal Cancer

- Symptoms:
  - fecal occult blood or ulcerative lesions manifest as anemia or rectal bleeding
    - distention, abdominal pain, vomiting, constipation
  - metastatic disease: weight loss, anorexia, possible palpable mass
- Prevention: ASA may < risk; routine monitoring for guaiac (+)
- Tx: colostomy repair; permanent colostomy for rectal tumors

References