COMMON GI INFECTIONS

Roberta Pratt, RN, MSN
Sarah Wood, RN, BSN
Pediatric Gastroenterology
University of Vermont Medical Center
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COMMON STOOL PATHOGENS INCLUDE:

- Clostridium difficile (c. diff)
- Giardia
- Cryptosporidium
- Post-infectious functional disorders

CLOSTRIDIUM DIFFICILE (C. DIFF)

- A toxigenic bacterium primarily affecting the colon
- Transmitted via spores
- Colonizes in the large intestine and releases exotoxins often causing colitis
Is the leading cause of GI-associated death and is the #1 health care-associated infection in the United States

Costs around $1.5 billion in extra expenditure yearly in the U.S. alone

**RISK FACTORS**
- Age
- Antibiotic use
- Altered intestinal ecosystem
- Immune response from host
- Comorbidities
- Hospitalization
- Acid Suppression (?)
- Presence of feeding devices

**SIGNS AND SYMPTOMS**
- Is possible to be colonized but asymptomatic
- Asymptomatic colonization common in children under 2 years of age
- Diarrhea, usually watery, up to 10-15+ times per day, often malodorous, “c diff smell”
- Abdominal pain and cramping
- Severe cases may include blood or pus in stool, fever, nausea, loss of appetite, dehydration, kidney failure
TRANSMISSION AND DIAGNOSIS
- Fecal-oral route
- Most commonly is acquired in a health care setting
- Spores are resistant to heat, acid and antibiotics
- Not tested in children under 2
- PCR stool test used at UVM and surrounding labs, can only be run on loose/watery stool

TREATMENT
ACUTE INFECTION:
- Oral antibiotics: metronidazole (Flagyl), vancomycin

CHRONIC INFECTION:
- Recurrence ranges from 20% after initial infection to 60% after multiple recurrences
- Antibiotics are effective in ~50% of first-time recurrences
- May try second-line antibiotics (fidaxomicin) or tapered or pulsed vancomycin
- Second and subsequent recurrences are very difficult to treat
- Surveillance testing
- Diverting ileostomy and colonic lavage with vancomycin

PROBIOTICS
- C diff pathogenesis disrupts gut microbiota
- Recent study of elderly patients with severe, recurrent infection showed complete resolution of symptoms in 84% of patients when kefir was used in combination with tapered antibiotic therapy.
- A Canadian study showed significant drop in recurrence rates over a 10 year period when probiotics used in adjunct with oral antibiotics
- VSL 3# (VSL DS is the prescription form) contain 8 strains of bacteria, 450 billion CFU (prescription strength contains 900 billion CFU)
- Prebiotics feed probiotics
**Fecal Microbiota Transplant (FMT)**
- Used in patients with recurrent infection refractory to conventional antimicrobial therapy.
- Goal is to reconstitute and engraff a more diverse gut microbiome.
- Extremely high (up to 90%) rates of success.
- Donors are screened, sample is obtained and processed.
- Similar efficacy if administered during colonoscopy vs. via nasogastric tube.

**Limitations:**
- Reported resolution is short-term only.
- Potential long-term adverse effects still unknown.
- New-onset obesity in a patient who received stool from an obese donor.
- ? Premature acceleration of aging if adult sample is given to a pediatric patient.
- ? Unintended consequences of microbiota transfer across gender divides.

**Infection Prevention**
- No effective vaccine available.
- **Hand washing** with hot, soapy water.
- Spores are resistant to heat and acid.
- Decontamination of surfaces—bleach.
- Minimize antibiotic use.
- Probiotics for prevention.
GIARDIA
- Parasite that infects primarily the small intestine
- Is the #1 leading cause of human intestinal parasitic infection
- Transmitted through person-to-person contact and through contaminated food or drinking water
- Often associated with more prolonged, chronic diarrhea even in immunocompetent patients, especially children
- Infections are more frequent and severe in young children: daycare centers, travelers, hikers
- Only about half of all those positive when stool tested are symptomatic
- Watery diarrhea, epigastric pain, nausea, vomiting
- Can cause post-infectious syndromes
- Most infections are self-limiting
- Giardia has several classes of drugs with good efficacy (Flagyl, Alinia)

CRYPTOSPORIDIUM
- Parasite that infects primarily the small intestine
- One of the most significant parasitic causes of diarrhea worldwide
- Transmission is fecal-oral, often waterborne
- Watery diarrhea, abdominal cramping, vomiting, low-grade fever
- Often is self-limiting in immunocompetent individuals
- Immunocompromised hosts are more susceptible and infection can be more widespread
- Cryptosporidium has only one moderately effective drug: nitazoxanide (Alinia)

INFECTION PREVENTION
Is essentially the same for both giardia and cryptosporidium:
- HAND WASHING
- Keep children out of daycare, public swimming pools while having diarrhea
- Can be found in rodents, household pets, livestock, other animals in the wild
POST-INFECTIOUS FUNCTIONAL DISORDERS

- A combination of chronic and recurrent GI symptoms not explained by structural or biochemical abnormalities

- Irritable bowel syndrome (IBS) is the most prevalent and best-studied functional GI disorder—affects up to 11% of general population

- Inflammatory stimuli may trigger a visceral hyperalgesic state and alter bowel motor function

- Risk factors
  - Gut-Brain Axis....now coming to be known as the Gut-Brain-Microbiota Axis

- Early research has shown benefits to probiotic use (already used to treat IBS in our practice)
- Fiber can alter microbiota
- FODMAP diet—restriction of fermentable oligosaccharides, disaccharides, monosaccharides and polyols
  - Consumption of FODMAPs increases intestinal gas and small intestinal water volume→ increased pain and bloating
  - Usually recommended for two weeks to start
  - Difficult to adhere to, especially in pediatrics
REFERENCES


REFERENCES CONT’D


