18 – GI Infections: Part I

Speaker: James Platts-Mills, MD

GI Infections Part 1

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- **Disclosures of Financial Relationships with Relevant Commercial Interests**

  - None

Q1. The morning after families had arrived at a camp for a week-long retreat, approximately one-third of participants had developed nausea (65%), vomiting (44%), abdominal cramps (85%) and diarrhea (94%) during the night. The night prior, they shared a meal which consisted of a casserole containing macaroni, frozen mixed vegetables, ground beef, turkey, and gravy. The mean onset of symptoms was 11 hours after the meal. All affected persons were substantially improved within 24 hours after onset and there were no apparent secondary cases.

Which one of the following is most likely responsible for this outbreak?

A) *Staph aureus*
B) *Clostridium perfringens*
C) Enterotoxigenic *E. coli*
D) *Listeria monocytogenes*
E) Norovirus

Time from food exposure to symptoms and differential for foodborne illness

- Symptoms (mostly vomiting) that begin within six hours suggest ingestion of a preformed toxin of *Staphylococcus aureus* or *Bacillus cereus* (emetic syndrome)
- Symptoms that begin from 6 to 24 hours suggest infection with *Clostridium perfringens* or *Bacillus cereus* (diarrheal syndrome)
- Symptoms that begin after more than 24 hours can be consistent with a much broader differential (*Salmonella*, *Campylobacter*, *E. coli*, norovirus, etc)

Q2. A nursing home experiences an outbreak of diarrhea with fever among long-term residents. Over the course of several weeks, additional residents develop illness one to three days after contact with illness cases.

Which one of the following organisms is the most likely cause?

A) *Salmonella enterica* (non Typhi)
B) *Vibrio cholerae*
C) *Shigella sonnei*
D) Enterotoxigenic *E. coli* (ETEC)
E) Toxin-producing strain of *Staph aureus*

Infectious doses for common enteric pathogens

10^{5-8}	10^{1-3}
*Salmonella**	*Shigella*
E. coli (ETEC, EPEC, EAEC, EIEC, EHEC)	*Giardia lamblia*
V. cholerae	*E. histolytica*
Campylobacter jejuni	*Cryptosporidium*
	Viruses
Only from food, water, other non-human sources	... also can be spread person to person

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Q3. A previously healthy 30-year-old traveler went to India for a one week work trip and developed diarrhea and fever on the fifth day of travel. After 36 hours of watery diarrhea, they experience increasing abdominal pain and frequent small-volume bowel movements containing blood and mucous.

Which of the following would be the most appropriate empiric therapy for this patient?

A) Ciprofloxacin
B) Azithromycin
C) Nitazoxanide
D) No antibiotic therapy recommended
E) Rifaximin

Q4. A 45-year-old male with no past medical history develops watery diarrhea 4 days into a two-week trip to South Asia. He has had to limit his activities, but is able to eat and drink and has access to a bathroom in his hotel room.

Which of the following would be the most appropriate empiric therapy for this patient?

A) Ciprofloxacin
B) Azithromycin
C) Nitazoxanide
D) No antibiotic therapy recommended
E) Rifaximin

2017 IDSA guidelines: Empiric therapy for traveler's diarrhea

"We suggest not treating most cases of travelers' diarrhea with antibiotics. Antibiotic treatment is reasonable for travelers with **severe diarrhea**, which is characterized by fever and blood, pus, or mucus in the stool, or for travelers with diarrhea that **substantially interferes with the purpose of travel**. Antibiotic treatment can reduce the duration of travelers' diarrhea from several days to one or two days. However, drawbacks to antibiotics include cost, potential side effects, and promotion of bacterial resistance, which is an increasing concern. The **benefit of antibiotics may not outweigh the drawbacks** in many individuals with travelers' diarrhea."

If treating, favor azithromycin>ciprofloxacin 2/2 resistance, adverse effect profile

Guideline definition of severe diarrhea: diarrhea that is incapacitating or completely prevents planned activities; all dysentery (passage of grossly bloody stools) is considered severe.

Q5. A 35-year-old female presents for a post-travel evaluation six weeks after return from a trip to Costa Rica. During travel, she had fever and diarrhea and self-administered azithromycin 500mg PO x 3 days. Since returning, she has had intermittent abdominal pain, bloating, and loose stools. A multiplex PCR panel including common bacteria, viruses, and intestinal protozoa is negative.

Which of the following would be the most appropriate next step in management for this patient?

A) Serologic testing for Celiac disease
B) Referral for endoscopy
C) Initiate treatment with nitazoxanide
D) Reassurance and expectant management
E) Modified acid-fast stain of a stool sample

2017 IDSA guidelines – role of diagnostics

(Culture-independent) diagnostic testing is recommended for diarrhea accompanied by: 1) fever; 2) bloody or mucoid stools; 3) severe abdominal pain/cramping/tenderness; 4) sepsis; 5) immunocompromised state (include testing for *Cryptosporidium*, *Cyclospora/Isospora*, microsporidia, MAC, CMV)

Also if concern for an outbreak, or populations with public health implications (e.g. food workers, healthcare workers)

Consider *Yersinia* if abdominal pain/concern for mesenteric adenitis; consider *Vibrio* if rice water stools/exposure to salty/brackish water/consumption of shellfish/travel to cholera-endemic regions; **Consider intestinal parasites in the setting of persistent diarrhea after travel**

A typical GI pathogen panel

BACTERIA:
- *Campylobacter (jejuni, coli, and upsaliensis)*
- *Clostridium difficile* (toxin A/B)
- *Plesiomonas shigelloides*
- *Salmonella*
- *Yersinia enterocolitica*
- *Vibrio (parahaemolyticus, vulnificus, and cholerae)*
- *Vibrio cholera*

DIARRHEAGENIC E. COLI/SHIGELLA:
- *Enteroaggregative E. coli* (EAEC)
- *Enteropathogenic E. coli* (EPEC)
- *Enterotoxigenic E. coli* (ETEC) *lt/st*
- *Shiga-like toxin-producing E. coli* (STEC) *stx1/stx2*
- *E. coli* O157
- *Shigella/Enteroinvasive E. coli* (EIEC)

PARASITES:
- *Cryptosporidium*
- *Cyclospora cayetanensis*
- *Entamoeba histolytica*
- *Giardia lamblia*

VIRUSES:
- Adenovirus F40/41
- Astrovirus
- Norovirus GI/GII
- Rotavirus A
- Sapovirus (I, II, IV, and V)

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A typical GI pathogen panel (Additional stool-based diagnostic needed)

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- *E. coli* O157
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PARASITES:
- *Cryptosporidium*
- *Cyclospora cayetanensis*
- *Entamoeba histolytica*
- *Giardia lamblia*
- Microsporidia (*E. bieneusi, E. intestinalis, etc)*
- *Cystoisospora* belli

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Post-infectious Irritable Bowel Syndrome

- ~10-30% of patients will develop IBS after acute gastroenteritis, which can be persistent, in particular after bacterial diarrhea (*Campylobacter*, *Shigella*, *Salmonella*).
- Pathophysiology includes dysbiosis, SIBO, altered gut motility, enteropathy. Can persists for months to years, but generally follows a progressively improving course.
- Treatment options include rifaximin, low FODMAP diet, loperamide, anti-depressants

Q6. A 24-year-old male presents to the emergency room with several days of watery diarrhea, nausea, and vomiting. He returned three days prior from a weeklong trip to India. Vital signs are T 37.5C, BP 80/52, HR 118, O2 98%. Physical examination is notable for dry mucous membranes. Labs are notable for HCT 50, Na 144, K 3.0, HCO3 12, BUN 41, Cr 1.2.

What is the most likely cause of his illness?

A) *Campylobacter jejuni*
B) Rotavirus
C) *Vibrio cholerae*
D) *Shigella sonnei*
E) Adenovirus Type F

Q7. A 42-year-old male presents to the emergency room with fever, abdominal pain, and constipation. He returned from a business trip to India two weeks prior and was in his usual state of health until the onset of fever and fatigue 4 days prior to presentation. His fevers worsened and were accompanied by abdominal pain, poor appetite, and constipation. Blood cultures revealed a Gram negative rod.

What is the most likely cause of his illness?

A) *Campylobacter jejuni*
B) Plasmodium falciparum
C) *Salmonella Typhi*
D) *Shigella flexneri*
E) Enteroinvasive *E. coli*

Geography/pathogen associations

Location	Pathogen
India/Bangladesh/Pakistan	*Salmonella* Typhi
Africa > Asia	Nontyphoidal *Salmonella*
South/Southeast Asia and Africa	*Vibrio cholerae*

To be continued…