

IBS CME Isfahan

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Session 6 Microbiology

Who is Who ?

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Topics

- Acute Diarrhea: diagnosis and management
- PI-IBS: diagnosis
- Dysbiosis-targeted antibiotics: SIBO vs. MBO

Topics

- Probiotics in travelers diarrhea prevention
- Probiotics in acute gastroenteritis management
- Probiotics in antibiotic associated FGID
- Probiotics in IBS

Scenario

- A 20-year-old woman is evaluated for a 2-day history of mild watery diarrhea occurring two or three times daily. She has not lost weight. Two days before symptoms developed, he returned from a 2-week trip to Mazandaran.
- On physical examination, temperature is 37.4 °C (99.4 °F), blood pressure is 120/80 mm Hg, pulse rate is 92/min, and respiration rate is 16/min. Abdomen is soft, nontender, and nondistended. Bowel sounds are normal.

Acute Diarrhea: diagnosis and management



Acute Infectious Diarrhea

Classified by severity:

- non- inflammatory diarrhea (milder)
 - disrupting the absorptive or secretory mechanisms of the small bowel
 - do **not** typically **invade** the mucosa
 - fecal leukocytes are usually absent

Etiology:

- **Most viral** such as **rotavirus** & **norovirus**
 - Cause large outbreaks
 - Symptoms last 2 to 3 days
- Some **Bacterial** (non- inflammatory) :
 - Enterotoxigenic **E. coli** and **Vibrio cholera**
 - Enterotoxigenic E. coli → travelers' diarrhea
 - last up to 7 days
 - Vibrio cholera
 - less common
 - present with extreme diarrhea
 - cause large epidemics
 - in countries with unclean drinking water or poor sanitation
- inflammatory diarrhea (more severe)

Diagnosis

Acute diarrhea

- The majority of cases are infectious in etiology.
- Most patients will have self-limiting symptoms and do not require testing.

Indications for stool studies:

- Severe dehydration
- Bloody stools
- > 6 unformed stools in 24 hours
- Fever $\geq 38.5^{\circ}\text{C}$
- Duration > 48 hours without improvement
- Recent antibiotic use
- Severe abdominal pain
- High-risk population (elderly, immunocompromised patients , those with known inflammatory bowel disease)

Clinical Presentation

- **Determine duration:**
 - Acute
 - Chronic
- **Characterize the diarrhea type:**
 - Watery (may be secretory or osmotic)
 - Steatorrhea (likely from malabsorption)
 - Bloody (likely inflammatory)
 - Mucoid (likely inflammatory)

Associated symptoms:

- Fever
 - Abdominal pain and cramping
 - Flatulence and bloating
 - Nausea and vomiting (especially due to an infectious or toxin-mediated etiology)
 - Tenesmus
- **Signs of dehydration:**
- Dry skin and mucous membranes
 - Poor skin turgor
 - Fatigue
 - Tachycardia
 - Rapid breathing

Stool analysis:

- Fecal leukocytes
- Ova and parasites
- Stool culture and polymerase chain reaction (PCR)
- Occult blood
- Lactoferrin
- *C. difficile* toxin immunoassay (particularly if there is recent antibiotic use)

Supporting laboratory evaluation:

- Generally done only in patients with severe disease and evidence of dehydration
- CBC:
 - Leukocytosis
 - Eosinophilia → may indicate a parasitic infection
 - Significant bandemia → common in *C. difficile*
 - Basic metabolic panel:
 - Electrolyte abnormalities (hypokalemia)
 - ↑ Creatinine → acute kidney injury
 - Non-anion gap metabolic acidosis

Antibiotics & acute diarrhea

- most diarrheal illnesses are viral
 - So, antibiotics is **not** recommended
- **Severity** of traveler with diarrhea
 - (fever, abdominal pain, bloody stool, and sepsis)
 - **Mild** travelers' diarrhea → should **not** be treated with antibiotics
 - **Moderate** to severe travelers' diarrhea
 - (**Fluoroquinolones**) or **Rifaximin** for noninvasive
 - resistance of *Campylobacter* to fluoroquinolones is increasing, so use azithromycin
 - enterohemorrhagic *E. coli*
 - Antibiotics should be **avoided**
 - risk of hemolytic-uremic syndrome due to Shiga-like toxin releases

Probiotics in acute gastroenteritis management



Probiotics in travelers diarrhea prevention



Leif Parsons for NPR

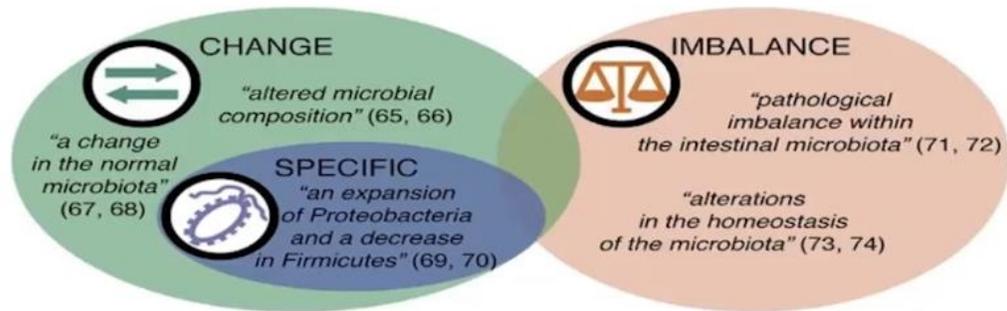
- She came back after 6 months to your office due to intermittent diarrhea and abdominal pain over the past several months. The patient has had bouts of diarrhea alternating with normal bowel movements, but lately the diarrhea has become more persistent and is now awakening her at night. The diarrhea is associated with crampy abdominal pain in both lower quadrants that subsides after a bowel movement.
- Both the pain and the diarrhea frequently occur after eating. There are also days when she feels constipated and passes a small amount of mucus only. During this time ,she has taken several antibiotics
- Vital signs and physical examination are normal. Stool testing for occult blood is negative, and blood cell counts and serum chemistry studies are within normal limits

Dysbiosis-targeted antibiotics: SIBO vs. MBO

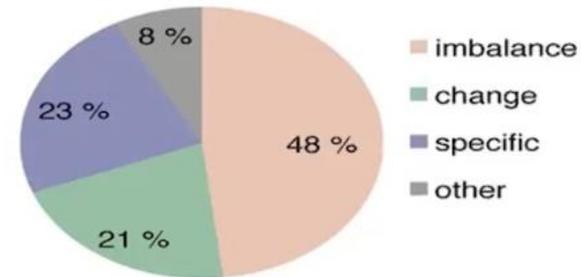


What is dysbiosis?

Types of definition



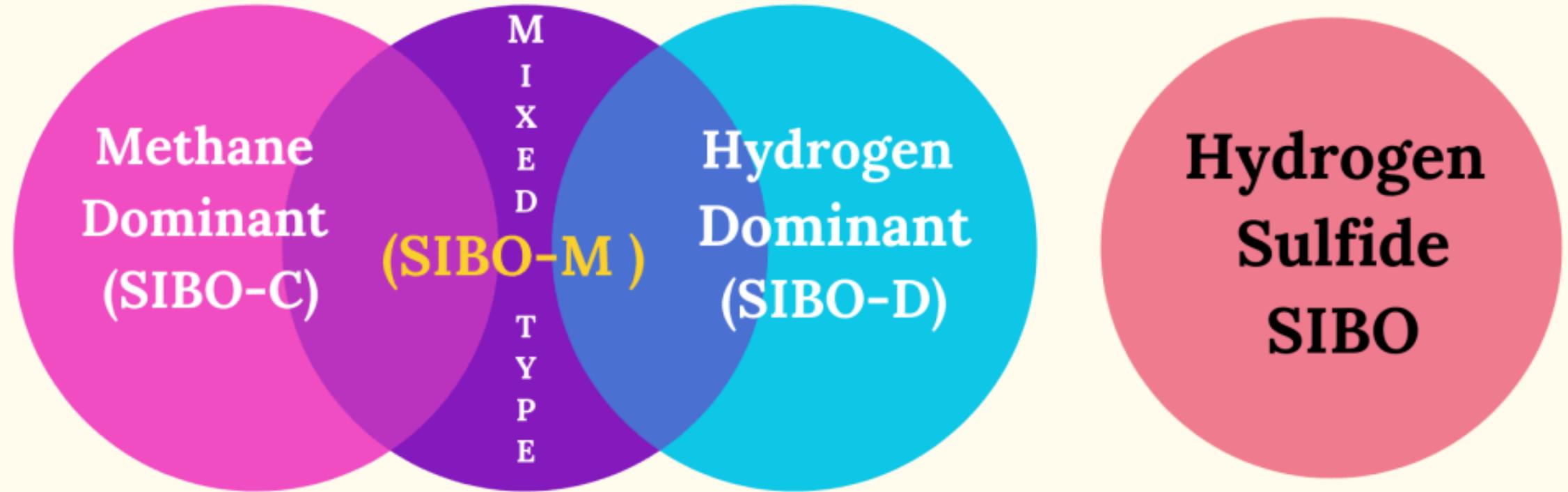
Frequency of use



17-3 Dysbiosis-targeted antibiotics: SIBO vs. MBO

- Small intestinal bacterial overgrowth (SIBO) is a condition associated with large numbers of bacteria colonizing the small intestine.
- **Intestinal methanogen overgrowth (IMO) is a newer term (possibly replacing methane dominant SIBO) to characterize an overgrowth of archaea throughout the intestinal tract.**

Types of SIBO



Probiotics in antibiotic associated FGID



PI-IBS: diagnosis



What is the role of antibiotics in IBS?

- Antibiotics are used in treating IBS due to their ability to alter intestinal microbiota
- neomycin and rifaximin
 - Neomycin improves symptoms but can cause adverse reactions. Rifaximin is a minimally absorbed oral antibiotic with a favorable tolerability profile
- After treatment, a greater percentage of patients reported relief of global symptoms and bloating compared to placebo.
- efficacy declines over time

What is postinfectious IBS (PI-IBS)?

1. ~10% of healthy individuals
2. after an infectious gastroenteritis
 - Almost bacterial
 - increased inflammation and neuroendocrine cells
3. Risk factors :
 1. female gender
 2. age < 60
 3. absence of vomiting
 4. prolonged diarrhea, anxiety, neurosis, somatization, and stressful life events

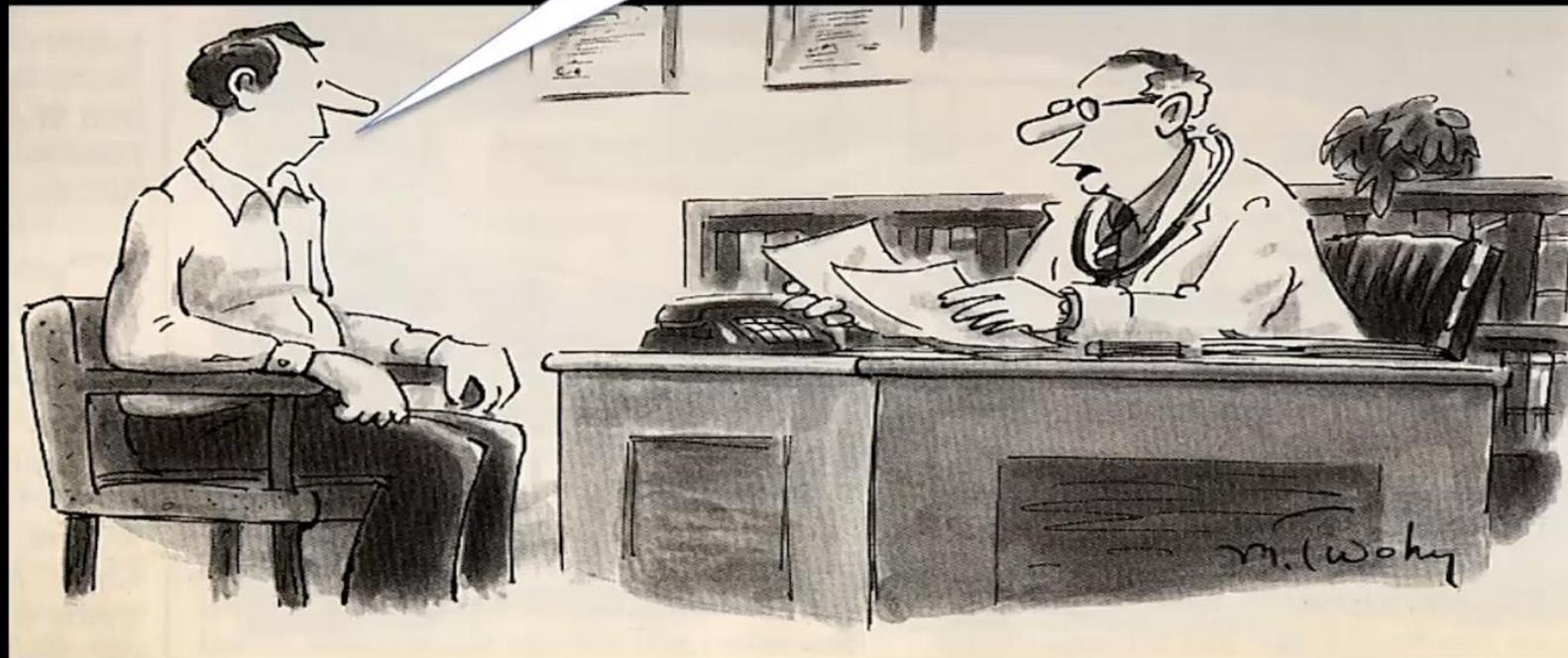
Probiotics in IBS



What is the role of the intestinal microbiota in IBS?

- some differences exist in the intestinal microflora of IBS Vs. healthy
- fecal microfloras of IBS
 - higher numbers of facultative organisms, such as Klebsiella species and enterococci
 - lower numbers of Enterobacteriaceae, lactobacilli, and bifidobacteria
- By DNA techniques, investigators have shown significant differences in IBS
 - for several bacterial **genera**, including Coprococcus, Collinsella, and Coprobacillus
- In addition, IBS-D and IBS-C also appear to have distinct microbial populations.

Is my microbiome okay?



Thank You

