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Management of Small Intestinal Bacterial Overgrowth (SIBO)

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Disclosures

Monica Nandwani

• No disclosures
Objectives

- Describe small intestinal bacterial overgrowth (SIBO)
- Outline diagnosis of SIBO
- Discuss current American College of Gastroenterology (ACG) clinical guidelines for the management of SIBO
SIBO: Definition

Excessive bacteria in the small bowel causing gastrointestinal symptoms

SIBO: Signs & Symptoms

- Nausea
- Bloating
- Flatulence
- Abdominal distention
- Abdominal cramping
- Abdominal pain
- Diarrhea
- Constipation
- Steatorrhea
- Weight loss
- Anemia
- Fat soluble vitamin deficiency

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SIBO: Protective Measures & Associated Disorders

Gastric Acid Secretion
- Acid-suppressing medications (PPIs)
- Autoimmune gastritis
- Surgery (vagotomy)

Pancreaticobiliary Secretions
- Chronic pancreatitis
- Exocrine pancreatic insufficiency
- Cirrhosis

Intestinal Motility
- Medications (opioids, anticholinergics)
- Autonomic neuropathy
- Scleroderma

Anatomic Integrity
- Small bowel diverticulum
- Surgical revision (Roux-en-y, IC valve resection)
- Fistulae/Stricture (IBD, radiation)

Innate and Adaptive Immunity
- Immunosuppressive medications
- CVID
- IgA deficiency
- HIV/AIDS

SIBO: Diagnosis

**Duodenal/jejunal Aspirate**
- ≥10³ colony-forming units per milliliter (CFU/mL)

**Breath Testing**
- Rise in exhaled hydrogen of at least 20 parts per million (ppm) above baseline within 90 minutes of oral ingestion of either 75g glucose or 10g lactulose

Diagnosis: Breath Testing for SIBO

**Glucose breath test**
- **75g**
- Can cause acute hyperglycemia and gut dysmotility in diabetics
- **Sensitivity:** 20 – 93%
- **Specificity:** 30 – 86%

**Lactulose breath test**
- **10g**
- May be preferred for diabetics as a non-absorbed carbohydrate
- **Sensitivity:** 31 – 68%
- **Specificity:** 44 – 100%

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**Recommendations**

1. We suggest the use of breath testing (glucose hydrogen or lactulose hydrogen) for the diagnosis of SIBO in patients with IBS (conditional recommendation, very low level of evidence).
Diagnosis: Breath Testing for SIBO

**Preparation**

- Avoid antibiotics for 4 weeks prior
- Avoid promotility agents and laxatives for 1 week prior
- Avoid fermentable foods day before
- Fast for 8-12 hours

**Avoid smoking**

**Minimize physical exertion**

**Not necessary to stop proton pump inhibitors (PPI) prior**

SIBO on Breath Testing

Increase in hydrogen concentration of ≥20 ppm from baseline within 90 minutes

Normal Breath Test

Intestinal Methanogen Overgrowth (IMO)

For methane, a concentration of $\geq 10$ ppm at any point during the test is indicative of methanogen colonization

# Hydrogen Breath Testing in the COVID-19 Era

**Elective procedure**  
- Patients should have negative COVID-19 test prior

**Aerosol-generating**  
- N95 mask, gloves, face shield (or alternative protective eye ware), gown

**PPE Recommendations**

Hydrogen Breath Testing in the COVID-19 Era

- Home breath test kits
Hydrogen Sulfide (H2S) Breath Test

Gas dynamics in the GI tract
- Hydrogen is consumed in the gut to produce methane and H2S gases

**HYDROGEN**
- Indicative of: Small Intestinal Bacterial Overgrowth (SIBO)
- Correlated with: No correlation with symptoms

**METHANE**
- Indicative of: Intestinal Methanogenic Overgrowth (IMO)
- Correlated with: Constipation

**HYDROGEN SULFIDE**
- Indicative of: Excess Hydrogen Sulfide
- Correlated with: Diarrhea

P1144 (S0507). SIBO Diagnosis: Clinical Survey of Practice Patterns, Unmet Needs, and Perception of a Novel Ingestible Diagnostic Capsule

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NYU Langone Health, New York, NY; NYU Langone Health, New York, NY; Progeny Inc., San Diego, CA

SIBO: Future Diagnostics

Capsule (Patented)
Auto-locates, collects and analyzes sample for TBC

Wearable receiver
Receives data from capsule

Conclusions
- Current tools for diagnosing SIBO are suboptimal.
- HR breath test and simple antibiotic therapy are widely used, however, most GIs are dissatisfied with both options.
- Endoscopic aspiration and culture is not commonly available.
- The clinical performance of the assay was viewed favorably by GIs and superior to breath testing, leading to a desire to replace existing approaches.
- A novel diagnostic ingestible capsule is viewed favorably and has the potential to replace both endoscopic aspiration and breath testing as preferred diagnostic test for suspected SIBO patients.

Fig 1. Of the 153 surveyed, 2/3 work in a private office group practice, of which about 1/3 are single specialty practices. A) Office Office Group Practice Site Specialties

Conclusions
- Current tools for diagnosing SIBO are suboptimal.
- HR breath test and simple antibiotic therapy are widely used, however, most GIs are dissatisfied with both options.
- Endoscopic aspiration and culture is not commonly available.
- The clinical performance of the assay was viewed favorably by GIs and superior to breath testing, leading to a desire to replace existing approaches.
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SIBO: Future Diagnostics

SIBO: Treatment Goals

Small intestinal decontamination

Prevention of recurrence

Treatment of underlying cause

Antibiotics

Diet

Prokinetics

# SIBO: Antibiotic Therapy

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Recommended dose</th>
<th>Efficacy</th>
<th>Duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonabsorbable antibiotic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rifaximin</td>
<td>550 mg TID</td>
<td>61 – 78%</td>
<td>14</td>
</tr>
<tr>
<td>Systemic antibiotic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin-clavulanic acid</td>
<td>875 mg BID</td>
<td>50%</td>
<td>10-14</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>500 mg BID</td>
<td>43 – 100%</td>
<td>10-14</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>100 mg QD to BID</td>
<td></td>
<td>10-14</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>250 mg TID</td>
<td>43 – 87%</td>
<td>10-14</td>
</tr>
<tr>
<td>Neomycin</td>
<td>500 mg BID</td>
<td>33 – 55%</td>
<td>10-14</td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>400 mg QD</td>
<td>30 – 100%</td>
<td>10-14</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>250 mg QID</td>
<td>87.5%</td>
<td>10-14</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>160 mg/800mg BID</td>
<td>95%</td>
<td>10-14</td>
</tr>
</tbody>
</table>

**Recommendations**

6. We suggest the use of antibiotics in symptomatic patients with SIBO to eradicate overgrowth and resolve symptoms (conditional recommendation, low level of evidence).

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SIBO: Recurrence

40% of patients with SIBO will have persistent symptoms after initial antibiotic treatment

Recurrent SIBO is also frequent particularly in:

• Older adults
• History of appendectomy
• Chronic PPI use

Pimentel M. *UpToDate*. 2020.
# SIBO: Recurrence Approach

## Second course of antibiotics
- If partial symptomatic improvement
- Early recurrence (<3 months)
- Consider repeat breath test if >3 months

## Antibiotic Prophylaxis
- Reserved for patients with $\geq 4$ distinct and well-documented episodes in 1 year and with risk factors
- Administer antibiotics periodically (5-10 days/month or every other week)
- Change antibiotics to prevent drug resistance

## Re-evaluate for alternative diagnosis if no improvement

## Elemental diet
- If unable to tolerate antibiotics
- Expensive
- Limited by palatability

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Pimentel M. *UpToDate*. 2020.
### SIBO: Other Therapeutic Considerations

#### Dietary Therapy
- Low FODMAP diet
- Gluten-free diet (no good evidence)
- Elemental diet

#### Probiotics
- Mixed/inconclusive data

#### Prokinetics

#### Herbal Therapy

#### Fecal microbiota transplant (FMT)
- Concrete data on effects of FMT on SIBO are limited

New ACG Clinical Guidelines in 2020 for SIBO

Most common symptom is bloating

Hydrogen breath testing is recommended for diagnosis
  • Aerosol generating procedure
  • Consider home breath testing
  • New breath test available that evaluates H2S

Antibiotics are recommended for treatment of SIBO in symptomatic patients
  • Also treat underlying etiology

Presence of excessive methane indicates IMO
References


