SESSION H3

Dietary Therapy for Irritable Bowel Syndrome
Shirley Paski, MD
Dietary Strategies for Irritable Bowel Syndrome
Shirley Paski, MD MSc FRCPC
shirley.paski@va.gov
Division of Gastroenterology
University of Washington/VA Puget Sound

Case
• 25yo F IBS since high school
• Random, seemingly unpredictable symptoms
  – Explosive diarrhea
  – Intermittent constipation
  – Cramping abdominal pain
• Started to limit diet in order to control symptoms
  – Sticks to 5 foods: chicken, bread, rice, bananas, tea
  – Hates eating → fears GI symptoms
  – Some symptom reduction, but issues persist

IBS is common and costly
• 10-22% of US population
  – ~30% seek medical consultation
  – Top 10 reason for PCP consultation
• $30 billion/yr direct & indirect healthcare cost
  – Increased absenteeism, health care utilization
  – 2-3x increased hysterectomy, appendectomy, cholecystectomy

ROME III Criteria for IBS
1. Abdominal pain/discomfort \( \geq 3x/\text{mo} \) for \( \geq 3\text{mo} \), with 2+ of:
   a) Improvement with defecation
   b) Change in stool frequency
   c) Change in stool appearance/form
2. No inflammatory, anatomic, metabolic, or neoplastic process that explain symptoms

Constipation, diarrhea, mixed subtypes.

Additional features
• Supportive, but not essential for diagnosis:
  – Abnormal stool frequency
    • \( >3/d \) or \( <3/wk \)
  – Abnormal stool form in several defecations
    • Lumpy, hard
    • Loose, watery
  – Abnormal stool passage in several defecations
    • Straining, urgency, incomplete evacuation
    • Passage of mucus in defecations
    • Bloating/abdominal distention \( >25\% \) of days
Red flags that may suggest organic disease

- Rectal bleeding/hematochezia
- Weight loss
- Fever
- Age >50, especially with new onset or change in symptoms
- Nocturnal awakening from sleep
- Family history of colon cancer, IBD, or celiac disease

Differential diagnosis

<table>
<thead>
<tr>
<th>Condition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malabsorption</td>
<td>Pancreatic insufficiency, celiac sprue, Whipple's disease</td>
</tr>
<tr>
<td>Dietary</td>
<td>Lactose, sorbitol, fructose, fiber</td>
</tr>
<tr>
<td>Drugs</td>
<td>Laxatives, magnesium, phosphate, many others</td>
</tr>
<tr>
<td>Metabolic disorders</td>
<td>Hypothyroidism, hyperthyroidism, diabetes</td>
</tr>
<tr>
<td>Inflammatory</td>
<td>Ulcerative colitis, Crohn's disease, microscopic colitis, mastocytosis</td>
</tr>
<tr>
<td>Tumors</td>
<td>Carcinoid, gastrinoma, colon cancer, villous adenoma</td>
</tr>
<tr>
<td>Infections</td>
<td>Giardia, Entamoeba histolytica, Yersinia enterocolitica, Campylobacter jejuni</td>
</tr>
</tbody>
</table>

Diagnostic testing

- Red flags, history/physical exam findings → targeted evaluation
- Celiac serology, CRP, TSH

Management

1. Address patient concerns
   - Usually very concerned about a serious cause for their symptoms
   - Take time to explore the patients agenda
   - Remember that investigations may heighten anxiety
2. Explanation symptoms
   - Offer a plausible reason for symptoms
   - Acknowledge relationship with stress
3. Symptom management

Bristol stool form scale

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Separate hard lumps, like nuts (hard to pass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2</td>
<td>Sausage-shaped but lumpy</td>
</tr>
<tr>
<td>Type 3</td>
<td>Like a sausage but with crust on the surface</td>
</tr>
<tr>
<td>Type 4</td>
<td>Soft blobs with clean cut edges</td>
</tr>
<tr>
<td>Type 5</td>
<td>Fluffy pieces with ragged edges, a mushy stool</td>
</tr>
<tr>
<td>Type 6</td>
<td>Watery, no solid pieces, empty container</td>
</tr>
</tbody>
</table>

Constipation

Diarrhea

Bristol stool form scale

- Fiber (soluble)
- PEG
- MoM
- Lubiprostone
- Linaclotide

Constipation

Diarrhea

- Fiber (soluble)
- Cholestyramine
- Antibiotics, rifaximin
- Loperamide
- Diphenoxylate
Pain & global symptoms, bloating

- Antispasmodics: dicyclomine, hyoscyamine, peppermint
- Low-dose antidepressants: TCA, SSRI
- Psychological: stress management, relaxation skills, cognitive restructuring → healthy thoughts, good sleep habits

Bloating

- Probiotics
- Non-absorbable antibiotics
- Low-FODMAP diet

Interventions for IBS

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Symptom</th>
<th>NNT</th>
<th>Recommendation</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialized diets</td>
<td>n/a</td>
<td>Weak</td>
<td>Very low</td>
<td></td>
</tr>
<tr>
<td>Prebiotics, probiotics</td>
<td>n/a</td>
<td>Weak</td>
<td>Very low</td>
<td></td>
</tr>
<tr>
<td>Soluble fiber</td>
<td>7-10</td>
<td>Weak</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>Probiotics</td>
<td>7</td>
<td>Weak</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Loperamide</td>
<td>Diarrhea</td>
<td>n/a</td>
<td>Strong</td>
<td>Very low</td>
</tr>
<tr>
<td>Rifaximin</td>
<td>Diarrhea</td>
<td>9</td>
<td>Weak</td>
<td>Moderate</td>
</tr>
<tr>
<td>PEG</td>
<td>Constipation</td>
<td>n/a</td>
<td>Weak</td>
<td>Low</td>
</tr>
<tr>
<td>Linaclotide</td>
<td>Constipation, pain</td>
<td>6</td>
<td>Strong</td>
<td>High</td>
</tr>
<tr>
<td>Lubiprostone</td>
<td>Constipation</td>
<td>12.5</td>
<td>Strong</td>
<td>Moderate</td>
</tr>
<tr>
<td>Antispasmodics</td>
<td>Pain</td>
<td>5</td>
<td>Weak</td>
<td>Low</td>
</tr>
<tr>
<td>Peppermint oil</td>
<td>Pain</td>
<td>3</td>
<td>Weak</td>
<td>Moderate</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>Global sx</td>
<td>4</td>
<td>Weak</td>
<td>High</td>
</tr>
<tr>
<td>Psychological tx</td>
<td>Global sx</td>
<td>4</td>
<td>Weak</td>
<td>Very low</td>
</tr>
</tbody>
</table>

Diet and IBS

- General recommendations:
  - Aim to eat a healthy, balanced diet
  - Eat every 3-4 hours
  - Avoid very large meals
  - Keep healthy snacks available
  - Take time to eat and chew well to avoid swallowing air
  - Take a few relaxed deep breaths before eating
  - Limit trigger foods

Common Food Intolerances

- Dairy
  - milk, cheese, eggs
- Cereals
  - wheat
- Caffeine
  - coffee, tea, chocolate, soda
- Alcohol
- Spicy foods
- High fat foods
- Sorbitol
- Meat & legumes
  - beef, pork, chicken, beans, nuts
- Fruit
  - citrus, apples, bananas, pears
- Vegetables
  - onions, broccoli, garlic, cauliflower, cabbage, brussels sprouts, corn, peas, potatoes

Lactose intolerance

- Variable prevalence,
  - ~20% northern Europe
  - ~75-99% African American, Native American, Asian
- Gas, bloating, diarrhea
- Trial low-fat dairy first
- If ongoing symptoms, try lactose-free diet x 1-2 wks
- Lactase tabs, Lactaid, naturally-lactose free dairy (eg cheddar cheese)
Fructose intolerance

- Commonly added as sweetener to soda, chocolate, syrups, and jams
- Naturally present in many fruits, veggies, and honey
- ~50% have significant malabsorption in high quantities
- Some association with depression

Sorbitol

- Polyalcohol sugar
- Sweetener in many diet foods, elixir medications
- Not absorbed by gut → osmotic effect, diarrhea

FODMAPs

- Fermentable Oligosaccharides, Disaccharides, Monosaccharides, and Polyols

Gluten-free popularity: truth or trend?

Non-celiac gluten sensitivity

- Individuals who cannot tolerate gluten
- Symptoms similar to celiac disease
- Lack antibodies and intestinal damage seen in celiac
- Generally less knowledgeable & less adherent to GFD
- No diagnostic tests; diagnosis of exclusion
- All research in very early stages
Wheat sensitivity shares features of celiac

\[\text{Wheat sensitivity} \n= \text{276} \]
\[\text{Celiac disease} \n= \text{100} \]
\[\text{IBS} \n= \text{50} \]

- \text{Anemia: 24\% 78\% 8\%}
- \text{Weight loss: 35\% 52\% 4\%}
- \text{Median sx duration (yrs): 7 4 7}
- \text{Median # EGDs: 3.5 1 0.5}
- \text{Self-reported wheat intoler: 50\% 22\% 14\%}
- \text{Family Hx celiac: 5\% 18\% 0\%}
- \text{Infant food allergy: 18\% 6\% 4\%}
- \text{Coexistent atopy*: 29\% 8\% 6\%}

*Atopy: rhinitis, conjunctivitis, bronchial asthma, atopic dermatitis

\[\alpha\text{-amylase trypsin inhibitors (ATIs) induce innate immune response}\]

- ATIs: proteins that confer increased pest resistance in wheat
- Selective breeding \(\rightarrow\) increased ATIs
- Activate innate immune response in cell culture

\[\text{ATI + gliadin increase IL8 expression in human duodenal biopsies}\]

\[\text{FODMAP, not gluten reduction reduces GI symptoms in self-reported NCGS}\]

\[\text{Gluten or grain?}\]

- Wheat sensitivity
- Alpha-amylase/trypsin inhibitors
- FODMAP intolerance
Rational approach to diet in IBS

- Most patients acknowledge impact of food on IBS, often with inappropriate restrictions
- 14-day food & symptom record helpful to identify triggers
  - Removal of suspected food groups → gradual reintroduction to confirm trigger foods
- Goal is to consume the most variety possible to reduce risk for malnutrition, nutrient deficiencies
- GI dietitian consult extremely useful

Food and symptom record

<table>
<thead>
<tr>
<th>Time</th>
<th>Symptoms</th>
<th>Situation</th>
<th>Feelings</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800</td>
<td></td>
<td></td>
<td></td>
<td>egg and cheese bagel, 12oz coffee</td>
</tr>
<tr>
<td>0840</td>
<td></td>
<td>Phone call from boss</td>
<td>Angry, frustrated</td>
<td>8</td>
</tr>
<tr>
<td>0900</td>
<td>Diarrhea, cramps</td>
<td></td>
<td></td>
<td>3 chicken fajitas, 1/2c salsa, 2c tortilla chips, 16oz diet coke</td>
</tr>
</tbody>
</table>

Trigger food journal

<table>
<thead>
<tr>
<th>Food</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td></td>
</tr>
<tr>
<td>- milk, yogurt, ice cream, cheese, cottage cheese, sour cream</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
</tr>
<tr>
<td>- Broccoli, cauliflower, cabbage, brussels sprouts, onions, corn, peas, potatoes</td>
<td></td>
</tr>
<tr>
<td>Fruit</td>
<td></td>
</tr>
<tr>
<td>- Apples, pears, citrus, bananas, berries</td>
<td></td>
</tr>
<tr>
<td>Meats/Beans/nuts</td>
<td></td>
</tr>
<tr>
<td>- Eggs, pinto beans, kidney beans, lentils, high fat red meat, nuts</td>
<td></td>
</tr>
<tr>
<td>Breads/Cereals</td>
<td></td>
</tr>
<tr>
<td>- Wheat</td>
<td></td>
</tr>
<tr>
<td>Misc</td>
<td></td>
</tr>
<tr>
<td>- Hummus, garlic, coffee, chocolate, beer, wine, liquor, sorbitol, spicy food, high fat food, other</td>
<td></td>
</tr>
</tbody>
</table>

Celiac disease

- Gluten
  - Protein in wheat, barley, rye
- Celiac disease
  - Immune-mediated response to gluten resulting in small bowel inflammation +/- systemic symptoms
- Prevalence
  - 0.95% Caucasian adults
  - 4.7% 1st degree relatives

Fasano et al., Arch Int Med 2003.

Celiac Iceberg

- Classic celiac disease:
  - Diarrhea
  - Malabsorption
  - Weight loss
  - Failure to thrive
Consider celiac screening

<table>
<thead>
<tr>
<th>Gastrointestinal</th>
<th>Systemic</th>
<th>Autoimmune associations</th>
<th>Malignancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Abdominal pain</td>
<td>• Anemia</td>
<td>• Dermatitis herpetiformis</td>
<td>• Non-Hodgkin lymphoma (intestinal, non-intestinal; T- and B-cell types)</td>
</tr>
<tr>
<td>• Bloating</td>
<td>• Chronic fatigue</td>
<td>• Type 1 diabetes</td>
<td></td>
</tr>
<tr>
<td>• Gas</td>
<td>• Weight loss</td>
<td>• Anphous ulcers</td>
<td></td>
</tr>
<tr>
<td>• Chronic diarrhea</td>
<td>• Osteopenia, osteoporosis, fracture</td>
<td>• Peripheral neuropathy, ataxia, epilepsy</td>
<td></td>
</tr>
<tr>
<td>• Microscopic colitis</td>
<td>• Amenorrhea</td>
<td>• Arthritis</td>
<td></td>
</tr>
<tr>
<td>• Constipation</td>
<td>• Infertility</td>
<td>• Thyroid disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Muscle cramps</td>
<td>• Sjogren’s syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gas</td>
<td>• Chronic active hepatitis, primary biliary cirrhosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cholangitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down, Turner, William syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Papillary thyroid cancer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Melanoma</td>
<td></td>
</tr>
</tbody>
</table>

Consider celiac screening

<table>
<thead>
<tr>
<th>Gastrointestinal</th>
<th>Systemic</th>
<th>Autoimmune associations</th>
<th>Malignancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Abdominal pain</td>
<td>• Anemia</td>
<td>• Dermatitis herpetiformis</td>
<td>• Non-Hodgkin lymphoma (intestinal, non-intestinal; T- and B-cell types)</td>
</tr>
<tr>
<td>• Bloating</td>
<td>• Chronic fatigue</td>
<td>• Type 1 diabetes</td>
<td></td>
</tr>
<tr>
<td>• Gas</td>
<td>• Weight loss</td>
<td>• Anphous ulcers</td>
<td></td>
</tr>
<tr>
<td>• Chronic diarrhea</td>
<td>• Osteopenia, osteoporosis, fracture</td>
<td>• Peripheral neuropathy, ataxia, epilepsy</td>
<td></td>
</tr>
<tr>
<td>• Microscopic colitis</td>
<td>• Amenorrhea</td>
<td>• Arthritis</td>
<td></td>
</tr>
<tr>
<td>• Constipation</td>
<td>• Infertility</td>
<td>• Thyroid disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Muscle cramps</td>
<td>• Sjogren’s syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gas</td>
<td>• Chronic active hepatitis, primary biliary cirrhosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cholangitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down, Turner, William syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Papillary thyroid cancer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Melanoma</td>
<td></td>
</tr>
</tbody>
</table>

Consider celiac screening

<table>
<thead>
<tr>
<th>Gastrointestinal</th>
<th>Systemic</th>
<th>Autoimmune associations</th>
<th>Malignancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Abdominal pain</td>
<td>• Anemia</td>
<td>• Dermatitis herpetiformis</td>
<td>• Non-Hodgkin lymphoma (intestinal, non-intestinal; T- and B-cell types)</td>
</tr>
<tr>
<td>• Bloating</td>
<td>• Chronic fatigue</td>
<td>• Type 1 diabetes</td>
<td></td>
</tr>
<tr>
<td>• Gas</td>
<td>• Weight loss</td>
<td>• Anphous ulcers</td>
<td></td>
</tr>
<tr>
<td>• Chronic diarrhea</td>
<td>• Osteopenia, osteoporosis, fracture</td>
<td>• Peripheral neuropathy, ataxia, epilepsy</td>
<td></td>
</tr>
<tr>
<td>• Microscopic colitis</td>
<td>• Amenorrhea</td>
<td>• Arthritis</td>
<td></td>
</tr>
<tr>
<td>• Constipation</td>
<td>• Infertility</td>
<td>• Thyroid disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Muscle cramps</td>
<td>• Sjogren’s syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gas</td>
<td>• Chronic active hepatitis, primary biliary cirrhosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cholangitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down, Turner, William syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Papillary thyroid cancer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Melanoma</td>
<td></td>
</tr>
</tbody>
</table>

Test all 1st degree relatives

- Mother
- Father
- Sister
- Patient
- Brother
- Son
- Daughter

Celiac diagnosis: blood serology + biopsy

Blood antibodies

Celiac Disease

Small bowel biopsy

- Non-Hodgkin lymphoma (intestinal, non-intestinal; T- and B-cell types)
- Small bowel adenocarcinoma
- Peripheral neuropathy, ataxia, epilepsy
- Dermatitis herpetiformis
- Anphous ulcers
- Osteopenia, osteoporosis, fracture
- Amenorrhea
- Infertility
- Muscle cramps
- Dental enamel defects
Start with celiac serology → EGD

- Serology:
  - Tissue transglutaminase (TTG) IgA + total IgA
  - Deaminated gliadin peptide (DGP) IgG if IgA def or high probability patients
  - Conventional anti-gliadin Ab present in many healthy ind’ls → no role in celiac disease diagnosis
- EGD:
  - Everyone with positive serology
  - Everyone with high suspicion, even if serology negative

Endoscopic features: scalloping, mosaic

Duodenal histology

Normal
Celiac disease

DDx of +TTG

- Crohn’s disease
- Diabetes
- Arthritis
- Connective tissue disease
- Liver disease (cirrhosis)
- Heart failure
- Down syndrome
- Higher TTG, EMA → ↑ mucosal damage

Not all that scallops is celiac

- NSAID use
- Autoimmune enteropathy
- Post-viral enteritis
- Eosinophilic gastroenteritis
- Common variable immunodeficiency
- Small bowel bacterial overgrowth
- Tropical sprue
- Collagenous sprue
- Food allergy
- Drug-induced enteropathy (eg olmesartan)

Testing should be done on gluten-containing diet
Genetics are key in celiac disease

General population

Genetics are key in celiac disease

HLA DQ2 or HLA DQ8

Celiac disease

HLA genetic testing helps exclude celiac

• Self-started gluten-free diet (GFD) before testing
  — Offer gluten challenge if DQ2 or DQ8 positive
• Discrepancy between serology & histology
• Refractory cases, diagnosis in question
• High risk patient unable to communicate symptoms (eg Down syndrome)

“Gluten Challenge”

• Self-started GFD, negative serology, but HLA DQ2 or 8 positive

• 2 slices of bread (3g gluten) daily x 6 weeks → serology, small bowel biopsy
  — Negative at 6 weeks but tolerating → consider 2-6 week extension
• Test at 2 weeks if patient ++ symptomatic

Celiac disease confirmed....

Initial management

• Strict gluten-free diet
  — Dietitian counseling
  — Support group
  • GIG – Gluten Intolerance Group www.gluten.net
  — Multivitamin & multi-mineral supplement

Initial management, cont

• Screen for nutritional disorders & complications:
  — CBC, CMP
  — Iron, folate, vitamin D, vitamin B12, zinc, copper + other micronutrients as indicated
  — Bone mineral density, thyroid
• Screen family members
Long-term management

- Clinical improvement
  - Symptoms
  - Associated conditions
- Adherence can be difficult
  - Blood serology every 3-6mo until negative, then q12mo
  - Dietary adherence esp difficult when eating out
  - Consider repeat upper endoscopy

Recurrent/persistent symptoms

- 80% → 80% better within 1 month on GFD
- Investigate with serology, upper endoscopy
- Consider:
  - Gluten ingestion (most common)
  - Associated conditions:
    - Microscopic colitis
    - Refractory celiac disease
    - Lymphoma
  - Other GI conditions:
    - IBS
    - SIBO
    - Disaccharidase deficiency
    - Pancreatic insufficiency

Take home points

- Treatment of IBS requires a strong physician-patient relationship and is not limited to the gut
- Dietary triggers are common
  - Poorly absorbed carbohydrates “FODMAPs”
    - Lactose, sorbitol, fructose
  - Non-celiac gluten sensitivity
- Take a rational approach to identifying triggers, skilled GI dietitian is invaluable

Patient Resources

- Patient Workbook:
- Low-FODMAP Cookbook:
- Gluten Intolerance Group (GIG)
  - www.gluten.net