Irritable Bowel Syndrome, Inflammatory Bowel Disease and Gastroesophageal Reflux Disease Study Guide

Class Preparation:
Before class, students will be expected to review the online lecture, study guide and referenced literature.

Definitions:
Irritable bowel syndrome (IBS) is an extremely common condition characterized by the presence of abdominal pain or discomfort, with altered bowel habits, in the absence of any other disease to cause these types of symptoms. IBS should not be confused with inflammatory bowel disease, which is discussed below. IBS primarily affects the muscular contractions of the colon and does NOT cause inflammation.

Inflammatory bowel disease (IBD) is defined as chronic inflammation of the digestive tract. In IBD, the immune system registers food in the intestine as a foreign substance. It sets up attack of the cells of the intestines, and in the process, sends a cascade of different types of white blood cells that infiltrate the lining of the intestines to produce inflammation. Types of IBD include Crohn’s Disease (CD) and Ulcerative Colitis (UC). Ulcerative colitis is inflammation of the innermost colon and rectum. Crohn’s Disease is inflammation of the large intestine, small intestine, or both.

Gastroesophageal reflux disease (GERD) is a chronic disease that occurs when stomach acid and/or stomach content flows back into the esophagus, which in turn, irritates the lining of the esophagus. Having a few episodes of gastroesophageal reflux, also referred to as ‘acid reflux’ or ‘heartburn’, is not the same as having the disease. Symptoms of heartburn and acid reflux must occur at least two times every week, or they must significantly impact daily life in order for a diagnosis of GERD to be made. A diagnosis can also be made if the doctor can visualize damage to the esophagus.

Prevalence:
Irritable bowel syndrome is the most commonly diagnosed gastrointestinal condition. It is estimated that as much as 20% of Americans have IBS. IBS is most prevalent in South America and least prevalent in Southeast Asia. There appears to be a gender disparity as well. In US, Canada, and Israel, IBS is 1.5-2 times more prevalent among women than men. IBS is also more common among people younger than 45.

Inflammatory Bowel Disease has experienced a rapid increase in incidence and prevalence in recent decades. The CDC states that it is estimated to affect over 1 million Americans, and cases of IBD have been reported in all continents. UC appears to be more common in males, while CD is more common in females. There is ethnic disparity as well: IBD affects people of Caucasian and Ashkenazi Jewish decent more frequently than any other racial or religious group.

GERD, too, has experienced a rapid increase in prevalence in recent years. Its prevalence is approximated to be as high as 10-20% in Western countries. The incidence rates of GERD reported by 2 different studies were 4.5 and 5.4/1000 people per year.
SYMPTOMS:

Irritable Bowel Syndrome

Symptoms of IBS include abdominal pain, discomfort or cramping, feeling bloated, gas, diarrhea, constipation, alternating bouts of constipation and diarrhea, and mucus in stool. A person with IBS may have a combination of all or just a few of these symptoms listed here. Symptoms can be mild or so severe that they are debilitating to daily activities. An important characteristic of IBS is that symptoms are dynamic and can very well change over time. However, there are 3 different subtypes of IBS that are characterized by a predominant stool pattern:

- IBS with constipation (IBS-C): hard or lumpy stools \( \geq 25\% \) and loose or watery stools \(< 25\% \) of bowel movements
- IBS with diarrhea (IBS-D): loose or watery stools \( \geq 25\% \) and hard or lumpy stools \(< 25\% \) of bowel movements
- Mixed IBS (IBS-M): hard or lumpy stools \( \geq 25\% \) and loose or watery stools \( \geq 25\% \) of bowel movements

In the United States, it appears that IBS patients are equally distributed over the 3 different types of IBS.

Inflammatory Bowel Disease

Symptoms of IBD can have a substantial impact on a person’s daily life. They include diarrhea, fever, fatigue, abdominal pain and cramping, blood in stool, nausea and vomiting, reduced appetite, and unintended weight loss. Inflammation and ulcers in the digestive tract are what cause abdominal pain and cramping. Inflammation can take a toll on a person’s appetite, and this can cause a person to become malnourished and lose weight. Weight loss may also occur as an effect of malabsorption, since patients cannot properly digest and absorb food.

At first glance, these symptoms may seem similar to IBS; however, the cause of the symptoms in IBD is inflammation of the digestive tract. Symptoms will vary from patient to patient depending on how severe the inflammation is and where the site of inflammation is located.

Gastroesophageal Reflux Disease

Common symptoms of GERD include burning sensation in chest, chest pain, dysphagia, dry cough, sore throat, regurgitation of food or sour liquid, and sensation of a lump in one’s throat. Having a burning sensation in one’s chest is described as heartburn. This may spread up to the throat. Chest pain that is common with GERD patients is different in quality from the chest pain one feels during a myocardial infarction. Heartburn and chest pain may cause GERD patients to have difficulty breathing. Further, the regurgitation of stomach content into the throat and mouth may cause bad breath and tooth decay.

CAUSES:

Irritable Bowel Syndrome

The exact cause of IBS is unknown, though there are a constellation of factors that can contribute to the disease’s pathogenesis. In patients with irritable bowel syndrome, the muscle that lines their intestines may contract too strongly, resulting in gas, bloating and diarrhea. Conversely, the muscle may have weak contractions, resulting in pain and constipation. Environmental contributors to IBS symptoms include early life stressors, food intolerance, antibiotics, and enteric infection. There are host factors that
contribute to IBS symptoms as well. These include altered pain perception, altered brain-gut interaction, increased intestinal permeability, and increased gut mucosal immune activation. Contributing factors to IBS vary from person to person. Many people with IBS have more severe symptoms when they eat certain foods. In addition, many patients with IBS note that their symptoms are much worse during times of high stress. More recently, researchers believe that altered gut immune activation and intestinal permeability play a large role in causing IBS.

**Inflammatory Bowel Disease**

The exact cause of IBD is unknown as well. Diet and stress have been proven to aggravate symptoms of IBD; however, they have not been shown to be the direct cause of the disease. The popularity of the “Western” diet high in fat and protein, but low in fruits and vegetables, has been suggested as a possible explanation for the increase in IBD incidence in recent years. This could also explain why IBD is more common in developed countries where they eat more processed and high-fat food. Increased intake of sugar and refined carbohydrates has been associated with the development of IBD. Another possible explanation is immune system malfunction where an abnormal immune response causes the immune system to attack not only foreign material, but cells of the digestive tract as well.

**Gastroesophageal Reflux Disease**

There are many factors that may contribute to causing GERD. Relaxation of the lower esophageal sphincter (LES) causes stomach acid to flow back up into the esophagus, resulting in heartburn. An increase in relaxation of the LES along with an impaired LES basal tone or with gastric or esophageal motor dysfunction may lead to GERD. Genetics may play a role in the development of GERD as well. The role of genetics was illustrated by twin studies where hereditability played a role in 31-43% of cases. In addition, being overweight or obese, lack of regular physical activity, incorrect dietary habits, and smoking have been associated with causing GERD. This is because being obese or overweight can cause increased pressure on the abdomen, which increases the likelihood for GERD symptoms to result.

**Treatment:**

**Irritable Bowel Syndrome**

Though IBS does not have a cure, treatment of IBS focuses on the relief of the symptoms through diet, probiotics, medication, mental-health therapies, and lifestyle changes. The most important factor in treating IBS is a trusting patient-physician relationship. This is necessary because of how widely symptoms vary from patient to patient. Patients need to feel comfortable with their doctor in order to feel comfortable sharing the exact symptoms that they are experiencing in order to receive the correct treatment. Medications can be used to treat diarrhea and/or constipation. Antidiarrheals, such as Imodium, can help control diarrhea. Laxatives can relieve constipation. Further, low dose anti-depressants given in the absence of depression have been shown to inhibit the activity of neurons that control the intestines. Antispasmodics can relieve bowel spasms that result in painful cramps. Psychological or behavioral therapy has also been proven to be an effective treatment method for IBS, though not having not having time or access to mental health professionals limit this option for many patients. Managing stress may help reduce the severity of IBS symptoms. It is important to note that medications should be used as a last option for treatment of IBS. Diet and lifestyle changes should be attempted first before resorting to drugs.
Inflammatory Bowel Disease
Similar to IBS, IBD is not curable; however, the goal of treatment for IBD is to reduce inflammation of the intestines. Inflammation is the root of the detrimental symptoms in IBD. Anti-inflammatory drugs are commonly used, though they may cause adverse side effects. Immune system suppressors can be used to lessen inflammation. They suppress the immune system’s ability to release inflammation-inducing chemicals into the digestive tract.

Other medications may work to decrease the symptoms of IBD such as anti-diarrheals for chronic diarrhea and pain relievers for abdominal cramps. Iron supplements may be needed for patients with chronic bleeding. Vitamin B12 can be given to prevent anemia.

Finally, surgery may be an option for IBD patients if drugs do not relieve symptoms. Surgery for UC involves removing the entire colon and rectum. Surgery for CD involves removal of the damaged portion of the digestive tract. Surgery is not optimal, and thus it is important for patients to initially try using drugs and lifestyle modifications, which will be discussed in detail later on.

Gastroesophageal Reflux Disease
Again, GERD is not curable, but the symptoms can be managed. Antacids can provide rapid relief for GERD symptoms. They are often over the counter and a reliable treatment option for mild GERD symptoms; however they will not heal a damaged esophagus alone. H2-receptor blockers decrease acid production. H2-receptor blockers do not work as quickly as antacids do, but they provide long-term relief. Physicians often prescribe GERD patients both antacids and H2-receptor blockers. The antacid will neutralize the acidity of the stomach, and by the time it stops working, the H2 receptor blocker will prevent the stomach from creating more acid. Proton pump inhibitors (PPI) can be used to lower the amount of acid the stomach creates. PPIs are often better at healing the esophageal lining than H2-receptor blockers are.

If medications do not work very well, surgery can be done to reinforce or strengthen the lower esophageal sphincter.

FODMAPs
FODMAP stands for Fermentable Oligo-, Di-, Mono-saccharides, And Polyols. They are short chain carbohydrates and related alcohols that are poorly absorbed in the digestive tract. FODMAPs include fructose, lactose, galactose, sorbitol, manitol, and xylitol. All of these carbohydrates make up a large part of the “Western” diet. A diet low in FODMAPs may help to alleviate symptoms of GI disease such as diarrhea, constipation, or heartburn. Patient’s suffering from IBS, IBD, or GERD may want to endorse a low-FODMAP diet to alleviate symptoms of disease. Soon, we will take a look at the relationship of each of these different diseases with food.

FODMAP-Containing Foods
- Grains: wheat, rye, barley
- Vegetables: onion, garlic, asparagus, beetroot, leek, radicchio, broccoli, brussel sprouts, fennel, beans, cauliflower, mushrooms
**Fruits:** apple, apricot, blackberries, cherries, peach, plum, watermelon, pears  
**Dairy:** Butter, cow’s milk, traditional yogurt, soft cheeses, ice cream  
**Sweeteners:** honey, high fructose corn syrup

As you can see, FODMAPs make up much of the American diet. It can be a challenge for patients to put this diet into practice; however, guidance from their physician can be very helpful in taking on the challenge.

**Foods with Low FODMAP Content**
- Grains: grits, rice, quinoa, corn, oats  
- Vegetables: bell peppers, cucumber, carrots, corn, eggplant, lettuce, leafy greens, potatoes, squash, tomatoes, zucchini  
- Fruits: bananas, berries, cantaloupe, grapes, grapefruit, honeydew, lemon, orange, pineapple, tangerine  
- Dairy: lactose-free dairy, small amounts of cream cheese, and hard cheeses  
- Protein: chicken, beef, canned tuna, eggs, fish, lamb, pork, shellfish, turkey, nuts (not cashews or pistachios)

Although many foods are high in FODMAPs, there are also many delicious foods that contain very little. Showing patients this list can encourage them to eliminate FODMAPs from their diet. Not every single FODMAP-containing food triggers GI-related symptoms in patients. It is best to eliminate FODMAPs from diet all together, and then reintroduce FODMAP-containing foods one food at a time in order to figure out a patient’s exact trigger foods.

**Diet + Disease**

**IBS and Diet**

Many IBS patients associate their symptoms with eating. Approximately 90% of IBS patients restrict their diet to prevent or alleviate symptoms. Food intolerances or sensitivities are common in IBS, though an actual food allergy is not. Gluten can increase abdominal pain, bloating, worsen stool consistency and cause a feeling of tiredness. It may also alter gut permeability and immune activation. It may be helpful to suggest a gluten-free diet to patients with IBS.

Removing FODMAPs from diet has proven to be successful in treating people with IBS. FODMAPs can lead to increased water secretion from the small intestine and colon. This causes flatulence. In healthy adults, FODMAPs will not have a large effect; however, in someone with IBS, FODMAPs can trigger meal-associated symptoms. One clinical trial found that a low FODMAP diet caused 70% of the study’s participants to feel better regardless of IBS subtype.

For patients with IBS-C, eating a diet high in fiber will help to combat symptoms. Foods high in fiber include whole grain products, beans, apples, raspberries, broccoli, sweet potatoes, brown rice, and artichokes. However, fiber should be added into patients’ diets gradually, otherwise it can cause increased flatulence and abdominal discomfort. For patients with IBS-D, eating smaller meals more often, or eating smaller portions, may help to control diarrhea.

Overall, patients with IBS may want to avoid alcohol, caffeinated beverages, foods high in fat, milk products, and drinks with large amounts of artificial sweeteners. Trigger foods will vary from patient to
patient. In order to find out which foods trigger symptoms, encourage your patient to keep a diary. Patients should document what they eat during the day, what symptoms they have and when the symptoms occur. Diet is quickly becoming the primary intervention in treating IBS. As such, it is important to be educated on how diet can affect this disease, and further, it may be appropriate to involve a dietician in such cases.

**Inflammatory Bowel Disease and Diet**
There is no substantial evidence confirming the effect that different diets have on IBD; however, anecdotal evidence suggests that eliminating certain triggers foods can play a role in soothing symptoms of IBD. While diet does not cause the disease, the increase in prevalence of IBD in recent years suggests dietary influence. There are certain foods and beverages that can exacerbate symptoms. Many IBD patients have lactose intolerance. Cruciferous vegetables, alcohol, carbonated beverages and sugars should be avoided. Further, sometimes patients with CD cannot digest fat normally and it ends up causing diarrhea and abdominal pain. A diet low in fat and dairy products and high in cooked vegetables and lean protein may be beneficial. Since a low FODMAP diet fits this criterion, it may be helpful to eliminate FODMAPs from diet all together.

**Gastroesophageal Reflux Disease and Diet**
Many studies have illustrated that there is a relationship between obesity and GERD-related symptoms. Studies have shown that an increase in weight increases GERD symptoms and a decrease in weight decreases GERD symptoms. This indicates that weight loss is an effective method in the treatment of GERD.

GERD symptoms commonly occur after a meal and this suggests that certain foods may trigger heartburn. Studies have shown evidence that foods with high fat content, spicy foods, and alcohol may contribute to an increase in GERD symptoms, while eating a diet high in fiber may reduce symptoms. However, triggers vary from patient to patient. It is important to notify your patients of possible triggers and encourage them to keep a food diary in order to figure out their own trigger foods. Finally, overeating tends to increase GERD symptoms. Eating small amounts and eating slowly can help to decrease heartburn.

**Conclusions**

- There’s no causation between consumption of specific foods and IBS, IBD, or GERD. However, symptoms of all these diseases can largely be aggravated by diet.
- A diet low in FODMAPs, fat, dairy, or added sugars may be helpful in treating a patient with IBS, IBD, or GERD.
- A diet high in lean proteins can help relief symptoms of IBS, IBD or GERD.
- Disease Specific Dietary Modifications
  - IBS: avoid alcohol, caffeinated beverages, foods high in fat, milk products, and drinks with large amounts of artificial sweeteners
  - IBD: avoid cruciferous vegetables, alcohol, carbonated beverages and sugars, and diets heavy in fats and dairy products as many patients have lactose intolerance
- GERD: avoid alcohol, spicy foods and foods with high fat content.

- Patients should be counseled on dietary and lifestyle modifications during clinic encounters. In many cases, these changes are not enough and patients need to be started on medications that can modify disease progression.

- It is important to treat these patients in a case-by-case basis. Actively listen to your patient and show empathy. Work together with your patients to figure out what their trigger foods are and what they can eat to make them feel better.
References:


