Nutrition and IBD

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Objectives

- Review the effects of IBD on digestion and absorption
- Understand the importance of diet and nutrition in IBD
- Review strategies that are helpful in controlling IBD symptoms
- Answer questions
The Digestive System

- Digestion is the mechanical and chemical breakdown of the food we eat.
- The digestive tract is about 26 feet long and includes everything from the mouth to the anus as well as the organs that produce digestive chemicals (hormones, enzymes and secretions).
The stomach is a J-shaped muscular organ that receives and mixes food with digestive juices and propels food into the small intestines.

Gastric juices also include intrinsic factor:
- needed to absorb Vitamin B12.
The 3 sections of the small intestines are: duodenum (~10 inches), jejunum (~8 feet) and ileum (~12 feet).

Digestive fluids from the Liver (via the Gallbladder) and Pancreas are introduced in the duodenum.
Large Intestine

- The large intestine includes the cecum, colon, rectum, and anal canal.
- The large intestine absorbs water and electrolytes and forms and stores feces.
- It is about 5 feet long.
- The large intestine houses over 700 species of bacteria that perform a variety of functions.
Absorption

- The actual uptake of nutrients into the blood stream
- Most absorption takes place in the small intestines
- Having a healthy digestive system is imperative to proper absorption
- Enzymes are proteins that chemically breakdown food
- Digestive enzymes are made in the pancreas and intestines
- Many of the enzymes that digest food into the final stage prior to absorption are made in the brush border of the small intestine
The wall of the small intestine is wrinkled into thousands of folds and is carpeted with villi.

If you have ever watched a sea anemone with its fingerlike projections in constant motion, you have a good picture of how the intestinal villi move.

Microvilli
Circular muscles
Longitudinal muscles
Lymphatic vessel (lacteal)
Effects of IBD on Digestion/Absorption

- Crohn’s disease (CD)
  - Inflamed or surgically resected small intestine is less able to fully digest and absorb nutrients (can lead to malnutrition)
  - Incompletely digested foods that travel through the colon may also cause diarrhea

- Ulcerative Colitis (UC)
  - Small intestine works normally
  - Inflamed colon causes urgency and does not recycle water properly, resulting in diarrhea
Sites of Nutrient Absorption

- **Esophagus**: Water, ethyl alcohol
- **Stomach**: Calcium, magnesium, iron, fat-soluble vit. A & D
- **Duodenum**: Actively absorbed monosaccharides, glucose & galactose, calcium, magnesium, iron, fat (i.e., short-chain fa, long-chain fa, partially "split glycerides")
- **Jejunum**: Disaccharides, sucrose, maltose, lactose, water-soluble vit.: thiamine, pyridoxine, riboflavin, folic acid, ascorbic acid, proteins & amino acids, bile salts, vit. B12
- **Ileum**: Water, potassium, short-chain fa & volatile fa from fiber digestion
- **Colon**: Water, sodium chloride, potassium, short-chain fa & volatile fa from fiber digestion

Pipkin & Gadacz, p282, Nutrition Considerations in the ICU, 2002
Nutrition and IBD

- Patients w/ IBD may become malnourished due to
  - Loss of appetite
  - Increased nutritional needs w/ chronic disease (protein). Kcal needs are generally about the same as the general population
  - Poor digestion and absorption of nutrients (CD)
Diet and IBD

- Diet has not been proven to prevent IBD or provide substantial disease control.
- Diet can help symptoms while the disease is being treated in other ways (medication).
- Diet recommendations should be individualized depending on which disease (CD vs. UC), part of intestines affected and disease activity (remission vs. flare).
Special Diets

- There are several diets advertised specifically for IBD patients
  - Many claims by small number of subjects
  - Most have not been proven scientifically and benefits have not been seen in any formal studies
Diet

- Individual experiences should guide food selection
  - May be helpful to keep a journal to see if there is any pattern of problematic foods
- Be the least restrictive as possible and strive for a well balanced healthy diet
Not all patients are affected by the same foods

Some foods that may cause GI discomfort
- High fiber foods
- High fat foods
- Caffeine
- Alcohol
- Dairy (lactose)
- Spicy foods
Diet During a Flare

- Eat smaller more frequent meals, blander foods may be preferred (fiber as tolerated)
- Consider an oral supplement if intake is poor
- If stricture is present (CD)- avoid nuts, seeds, corn, popcorn and Chinese vegetables
- Restrict fat if malabsorption is an issue (1/3 of CD patients) if >2-3 feet of ileum is diseased this can lead to fat malabsorption
Nutritional Supplements

- May be necessary during the disease course if
  - Wt loss
  - Oral intake issues
  - Surgery
  - Obstruction
  - Severe inflammation
Nutrition Support Therapies

- Liquid Nutritional Supplements
  - Boost, Ensure, Carnation Instant Breakfast

- Enteral Nutrition (Tube Feeding)
  - Nutrient rich liquid formula administered through a feeding tube

- Parenteral Nutrition or TPN
  - Prolonged ileus or bowel obstruction
  - Small Bowel Fistula
  - Short Bowel Syndrome
Vitamin/Mineral Supplementation

- Multivitamin recommended for all
- Additional supplements may be needed depending on disease and location of disease
- Calcium and Vitamin D
  - Steroids
  - Decreased intake of dairy products
  - Malabsorption
  - Systemic inflammation
  - Recommend 1500 mg/day of calcium (from diet or supplement) and vitamin D (1000 to 2000 IU per day)
    - Have vitamin D level checked
Vitamin/Mineral Supplementation

- Vitamin B12 - if ileal disease (CD)
- Folic acid - sulfasalazine need to supplement 1 mg daily
- Iron - blood loss 300 mg 1-3 x per day
Supplementation

- Potassium/magnesium/zinc-losses from diarrhea and vomiting (replacement dependent on lab values)
- Trace elements – may need to be replaced w/ extensive small bowel CD
- Glutamine-lacks good data in humans
Probiotics

- Probiotics are live strains of these ‘good’ bacteria, which help our digestive system work efficiently, e.g. bifidus, lactobacillus and acidophilus.

- They are found in live yogurts or specially formulated powders, supplement pills or probiotic drinks which contain one or more of the strains of these bacteria.
Probiotics

- Only solid evidence is for pouchitis, antibiotic associated diarrhea and C. diff

- Pouchitis – VSL#3 (mixture of 8 probiotic bacteria) 2 packets per day $170/month, rarely covered by insurance
  - Remission in pt’s w/ recurrent pouchitis
  - Prevents pouchitis in the first year if taken after IPAA surgery
  - No evidence to support selective probiotics for treatment of pouchitis- lactobacillus GG as the primary therapy does not work
Omega 3 Fatty Acids

- Recent Cochrane review- Due to limited data there is not enough information available to determine whether fish oil treatment is effective for induction of remission in ulcerative colitis.
- Recent Cochrane review also concluded that Omega 3 Fatty Acids are probably not effective for maintenance of remission in CD.
- Fish oil was found to be safe in both groups.
Two Types of Dietary Fiber

- **Soluble Fiber**
  - Forms a gel when mixed with liquid and aids in bulking and moving food through the gut.

- **Sources**
  - Gums, oats, legumes, guar, barley, pectin, apples, citrus fruits, strawberries, carrots

- **Insoluble fiber**
  - Does not mix with liquids and passes through the GI tract mostly intact.

- **Sources**
  - Cellulose, wheat products, bran, whole grains, vegetables, fruits with edible seeds, lignin, hemicellulose
Benefits of Fiber

- Soluble fiber lowers cholesterol
- Fills the stomach and provides a sense of satiety
- Normalizes intestinal transit time-helps prevent constipation (particularly insoluble fiber)
- May help in reducing the risk of heart disease, colon cancer, obesity
Fiber

- Fiber is recommended same as the general population, but may need to restrict during disease flare if it is not well tolerated.
- Fiber will not make the disease worse, but can aggravate symptoms due to gas and bloating.
- 2/3 of CD w/small bowel disease develop strictures of the ileum- temporary low fiber diet is recommended until surgery or medical treatment corrects this.
- Low fiber diets limit short chain fatty acids which are the primary fuel for the colonocyte.
Recommended Intake

- American Dietetic Association recommends 25-35 g/day (approximately 6 grams from soluble fiber a day)
- Mix of soluble and insoluble fiber
- Excessive fiber intake may interfere with absorption of calcium and zinc, especially in children and the elderly
- Increase fiber intake gradually and drink plenty of fluids.
Fat

- May not be tolerated well if patient has ileal disease. Fat malabsorption occurs in 1/3 of CD pt’s
  - MCT- expensive and not very palatable
    - w/ ileitis or extensive resection of small intestine can get osmotic diarrhea if given too much
    - Up to 50 g /day (8tbsp) can be introduced in small amounts during the day
    - Does not contain essential fatty acids
Hydration

- Diarrhea losses
- Dehydration increases risk of kidney stones
- Aim for at least 8 cups of fluid per day or per physician.
- If excessive diarrhea use oral rehydration solution
Oral Rehydration Solution Recipes

1) Gatorade Base
   - 2 cups Gatorade
   - 2 cups water
   - ½ tsp salt

2) Grape or Cranberry Juice
   - ½ cup juice
   - 3½ cups water
   - ½ tsp salt

3) Apple Juice
   - 1 cup juice
   - 3 cups water
   - ½ tsp salt

4) 1 Liter Water
   - ¾ tsp table salt
   - 3 tablespoons sugar (sucrose)
   - 1 tsp baking powder (or ½ tsp baking soda)
   - ½ tsp 20% potassium chloride (by prescription only if needs replacing)
   - Sugar-free artificial flavoring or sweetener to taste

Herbal Supplements

- Include supplement use in medication history, discuss supplement use w/ MD
- Natural does not necessarily mean safe
- Follow recommended doses and duration of therapy
- Misinformation is common especially among retail Internet sites and health food stores
Dietary Supplements

1994 Dietary Supplement Health and Education Act (DSHEA)

- Under DSHEA the burden of proof of harm lies with the FDA meaning if the FDA has a safety concern about a supplement, the FDA must prove that the product will be harmful before requiring that the product be removed from the shelves.

- Quality assessment programs exist to verify the quality of individual product lots they do not exist to verify efficacy or safety.
Internet Sites for Supplements

- Natural Standard, [www.naturalstandard.com](http://www.naturalstandard.com)
- Supplement Watch, [http://www.supplementwatch.com](http://www.supplementwatch.com)
RD Vs. Nutritionist

How Is an RD Different Than a Nutritionist?

- The “RD” credential is a legally protected title that can only be used by practitioners who are authorized by the Commission on Dietetic Registration of the American Dietetic Association.
- Some RD’s may call themselves “nutritionists,” but not all nutritionists are registered dietitians. Virtually anyone can call him- or herself a “nutritionist” regardless of education or training.
- Individuals with the RD credential have fulfilled specific requirements, including having earned at least a bachelor’s degree (about half of RD’s hold advanced degrees), completed a supervised practice program and passed a registration examination—in addition to maintaining continuing education requirements for recertification.
Outpatient Counseling

- Discuss with your doctor to receive referral to see an RD
- Check with your insurance company to see if nutritional counseling is covered
- When meeting with RD it is helpful to provide necessary medical information
For More Information

- Crohn’s and Colitis Foundation of America Inc
  - www.ccfa.org
- National Digestive Diseases Information Clearinghouse
  - www.niddk.nih.gov/health/digest/niddic.htm
- Mayo Clinic Division of Gastroenterology and Hepatology
  - www.mayo.edu/int-med/gi/ibd.html
- United Ostomy Association www.uoa.org
- The American College of Gastroenterology http://www.acg.gi.org
- The University of Virginia Health System: Digestive Health Center
- American Gastroenterological Association and American Digestive Health Foundation
  - www.gastro.org