Case study

Irritable Bowel Disease
Clinical presentation:
A 21 y old MK female was well 4 weeks ago, she developed abdominal pain and diarrhea. Gradually the frequency of stools increased to 10/day with blood tinged stools. She developed fever, loss of appetite, wt. loss of 9-10lbs, stools studies were negative.

Labs:
Hb-9.1gm/dl
Albumin 2.1gm/dl
Colonoscopy reveals Crohn’s disease terminal ileal ulceration
Crohn’s disease: Areas affected
IBD results from a complex interplay

- Genetics,
- Immune
- Environmental factors.
- Malnutrition.
The area where most digestion occurs

- Which include the duodenum, jejunum, and ileum.
- Protein is metabolized to amino acids,
- Fats to glycerol and fatty acids
- Carbohydrates to mono- and disaccharides.

Role of small intestine
• 50/100000 - crohn’s
• 160/100000 - ulcerative colitis
• High in northern Europe
• Increased risk among South Asians & Jews
• More in females
• 60% to 75% of patients with Crohn’s disease experience malnutrition
• Children are at especially high risk for decreased bone mass and growth stunting
• In Pakistan no confirmed data exist but prevalence is 25-30% in patient admitted AKUH with G1 bleed as per rough estimates.


Prevalence of IBD & risk
Resection of the ileum

- Severe malabsorption and steatorrhea may occur, depending on the amount of the ileum that has been resected.
- Significant bacterial overgrowth can occur with the removal of the ileocecal valve. This occurs because of the lack of a barrier between the ileum and the colon and the migration of bacteria from the colon to the ileum.
- Bacterial overgrowth can cause malabsorption of carbohydrate, protein, fat, and fat-soluble vitamins.
- Osteopenia (prevalence between 40% to 50%)
- Osteoporosis (prevalence between 5% to 36%)
Clinical Features of resection

• Diarrhea
• Rapid transit
• Malabsorption
• B12 deficiency
• Deficiency of fat-soluble vitamins
• Calcium deficiency
• Magnesium deficiency
• Electrolyte disturbances
what factors do you think will alter nutrition status in IBD

- Decreased nutrient intake
- Fear of eating
- Anorexia, nausea, vomiting, diarrhea, abdominal pain
- Restrictive diets
- Medication side effects
- Oral ulcerations /taste changes
- Inflamed/ulcerated mucosa
- Blood loss through GI bleed
- Mal-absorption/ mal-digestion,
- Drug nutrient interactions
- Sulfasalazine is folic acid antagonist & may cause megaloblastic anaemia
- Lactose intolerance
- Deficiencies of iron, folate & vitamin C
Back to Patient
Patient is planned for resection 100cm of terminal ileum with formation of ileo-colonic anastomosis
What would be her Nutritional Support

• PN
• EN
• Oral
• OR --- Bowel rest
• Bowel rest is suggested to be used but no significant benefit has been noted in researches.

• In a prospective randomized trail a group was assigned bowel rest with PN & other group was started on low residue oral diet for 4 weeks, at the end of 4 weeks both groups showed decrease in disease activity.

• There has been increased interest in elemental diet but a European Crohn’s Society trail showed that there was no added benefit.
SHE WAS STARTED ON ORAL DIET & PEPTAMEN AS SUPPLEMENT
• Calories requirement - 30-40 kcal/kg/day
• Proteins - 1.5-2.0 gms/kg/day
• Small divided meals at frequent intervals.
• Food supplementation or fortification.
• Adequate fluid intake in presence of loose motions.
• Unnecessary food restriction without checking tolerance should be avoided.
• Omega three fatty acids supplementation prevents relapse, fish oils have been shown to reduce activity of macrophages, modulate secretory functions of cytokines & free radicals.

What is our experience in AKUH

- Elemental or polymeric liquid diets or complete bowel rest with parenteral nutrition is used to induce remission.
- Enteral or parenteral support in preoperative malnourished patients is advised.
- Medium chain triglycerides are easier to digest, can be added but generally use less fat.
- Fat soluble vitamins (A,D,E) supplementation is needed.
- People with strictures need to avoid fibrous foods, dried foods & nuts.
- Fluid intake of 35ml/kg/day & any daily symptoms related losses should be included.
- Lactose alternative should be included.
- Meal replacement formula – Peptamen – semi elemental formula
- Calcium gluconate or carbonate -500mg BD
- Magnesium gluconate or oxide-1-4g qd
- Ferrous sulfate -325mg qd
- Vitamin A- 10,000-25,000U qd
- Vitamin D- 10,000-50,000U 1-3 times /week
- Vitamin E-400-1000mg qd
- Folic acid -1mg qd
- Vitamin B12-1000mg qd
- Pancreatic enzymes- 1-3 tabs with meals
- Bile acid binding resin –cholestyramine 4-8g BID
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• Bile acid binding resin –cholestyramine 4-8g BID

( in case of fatty stools or steatorrhea bile acid binders & pancreatic enzymes are used )
Meta-analysis have shown that remission rates on EN are 60%, oral diet with low residue has shown to reduce Crohn’s Disease activity, a mixture of elemental diet + polymeric diet seems to work. Children have better growth & development with EN
• She does well for 5 days then she has smelly discharge from wound, investigations confirm enterocutaneous fistula formation in mid jejunum
• Since there is leakage from fistula, if leakage is high it result in alternation in nutritional status, due to losses of proteins, fluid electrolyte & zinc
WHAT WOULD BE NUTRITIONAL SUPPORT NOW

Bowel rest & TPN
• TPN was considered as primary therapy in CD, however a key study in 1988 showed that bowel rest was not the major factor in achieving remission.

• TPN carries the risk of sepsis, liver disorders, bacterial translocation & high cost.
• MK is put on bowel rest with TPN, output decreases, wound heals, in 3rd week she resumes oral nutrition with no further fistula drainage
Role of prebiotics & probiotics
• We have healthy bacteria in our gut which kill any dangerous invaders & helps make Vitamin K in our body.
• If we lose balance of these healthy organism due to stress antibiotics, poor diet choices.
• Probiotics are live microorganisms which confer health benefits to host, disturbance in intestinal flora can trigger IBD. Probiotics have high efficiency in ileal anastomosis.

• Probiotic bacteria like lactobacilli are naturally found in fermented foods like sauerkraut and yogurt.


Role of probiotics
Role of prebiotics & synbiotics in CD

- Prebiotics are fructooligosaccharides (FOS) & galactooligosaccharides (GOS) are specific short chain carbs that are healthy for GUT
- A combination of prebiotics & probiotics are called synbiotics, their fermentation releases SCFA which is immuno-regulatory
## Prebiotics in Ulcerative Colitis

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Fiber</th>
<th>Study</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fernandez-Banares</td>
<td>1999</td>
<td>Plantago ovata seed fiber 10 grams BID</td>
<td>Fiber +/- mesalamine in patients in remission</td>
<td>Equal to mesalamine in maintenance of remission</td>
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<tr>
<td>Kanauchi</td>
<td>2002</td>
<td>Barley 20–30 grams</td>
<td>Mild to moderately active UC</td>
<td>Decreased disease activity</td>
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<tr>
<td></td>
<td>2003</td>
<td></td>
<td>Patients in remission</td>
<td>Decreased abdominal pain, increased fecal butyrate</td>
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<tr>
<td>Hallert</td>
<td>2003</td>
<td>Oat bran 60 grams (fiber 20 grams)</td>
<td>IPAA</td>
<td>Deceased pouch inflammation</td>
</tr>
<tr>
<td>Welters</td>
<td>2002</td>
<td>Inulin 24 grams</td>
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*Source:* Adapted from References 168 to 171.

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**Meta-analysis**
How to Document NCP
Dietitians working with patients who have IBD disease should review the signs and symptoms obtained in the nutrition assessment and diagnose nutrition problems based on these signs and symptoms. Nutrition diagnoses from the list below as well as other diagnoses may be present.

- Inadequate oral intake (NI-2.1)
- Malnutrition (NI-5.2)
- Inadequate fluid intake (NI-3.1)
- Underweight (NC-3.1)
- Inadequate mineral intake (specify) (NI-5.10.1)
Food & feeding issues

<table>
<thead>
<tr>
<th>Common Nutrition Problem</th>
<th>Etiology of Nutrition Problem</th>
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<tbody>
<tr>
<td>Energy/protein</td>
<td>Insufficient intake</td>
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<tr>
<td></td>
<td>Anorexia</td>
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<td></td>
<td>Fear of abdominal pain and diarrhea after eating</td>
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<td></td>
<td>Increased protein needs (losses from gastrointestinal tract caused by inflammation)</td>
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<tr>
<td></td>
<td>Catabolism (when infection or absceses present)</td>
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<tr>
<td></td>
<td>Healing from surgery</td>
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<tr>
<td>Fluid and electrolytes</td>
<td>Short bowel syndrome</td>
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<tr>
<td>Iron</td>
<td>Blood loss, inadequate diet</td>
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<tr>
<td>Magnesium, zinc</td>
<td>Intestinal losses, especially from short bowel syndrome</td>
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<tr>
<td>Calcium and vitamin D</td>
<td>Long-term steroid use</td>
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<td></td>
<td>Decreased intake of dairy foods as result of lactose-restricted diets</td>
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<tr>
<td>Vitamin B-12</td>
<td>Surgical resections of stomach (loss of intrinsic factor) and/or terminal ileum (site of absorption)</td>
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<tr>
<td>Folate</td>
<td>Medications used to treat inflammatory bowel disease</td>
</tr>
</tbody>
</table>

• Inadequate oral intake (NI-2.1) related to discomfort after eating & diarrhea as evidenced by 1/3 normal intake for past 5 days.

• Inadequate mineral intake (iron) (NI-5.10.1) blood loss with diarrhea as evidenced by estimated intake approximately 50% of requirements.

• Altered GI function by ileal resection as evidence by poor diet intake leading to mal-absorption & B12 deficiency
Nutrition intervention will depend on the functional status of the gastrointestinal tract. During acute exacerbations of both ulcerative colitis and Crohn’s disease, extent of diarrheal output, obstruction, surgical and bleeding may direct the level of nutritional intervention. Enteral nutrition or parenteral nutrition is used as a supportive mechanism when an oral diet cannot meet nutritional needs (Eiden 2003).
• Examples of the approved nutrition monitoring and evaluation terminology that may apply to patients with inflammatory bowel disease include:

• Level of knowledge
• Vitamin profile
• Mineral profile
• Weight/weight change