

ADVANCES IN IBD

Current Developments in the Treatment of Inflammatory Bowel Disease

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Use of Parenteral Nutrition in Patients with Inflammatory Bowel Disease



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G&H How frequently are patients with inflammatory bowel disease malnourished or underweight?

CES Estimates suggest that 20–85% of patients with inflammatory bowel disease (IBD) are malnourished or underweight. However, this range includes data from older studies, and malnutrition may not be as common in today's patients due to improvements in diagnosis and therapy. Malnutrition occurs more frequently in patients with Crohn's disease (CD) than those with ulcerative colitis (UC).

There are several reasons why patients with IBD become malnourished. First, inflammation suppresses appetite and makes individuals catabolic, raising their metabolic rate. Second, both CD and UC can cause abdominal pain and diarrhea, so patients avoid eating in order to limit these symptoms. Third, patients with IBD lose protein from their ulcerations. Finally, patients with CD may not absorb nutrients due to a surgical bypass of their bowel, previous resection, or ulcerations in the bowel.

G&H How can parenteral nutrition benefit these patients?

CES For patients who have IBD and severe malnutrition, parenteral nutrition is a temporary measure that can help to maintain nutrition and vitamin/mineral status while they are awaiting response to medical therapy and/or surgery. In patients with CD and multiple small bowel resections resulting in short bowel syndrome, parenteral nutrition is given long term to maintain nutrition.

G&H What are the indications for preoperative parenteral nutrition?

CES There are no large studies looking at preoperative parenteral nutrition in IBD patients alone, so clinical practice is based on studies examining the use of parenteral nutrition in a broader population of preoperative patients. In general, parenteral nutrition is recommended in severely malnourished preoperative patients who are unable to eat or be tube fed. Severe malnutrition is defined as loss of more than 5% of body weight in 1 month or 10% in 6 months, a body mass index less than 19 kg/m², or an albumin level less than 3 g/dL.

One caveat is that albumin levels are difficult to interpret in patients with IBD because albumin levels are also affected by inflammation. In a patient with IBD, a low albumin level is often more of a marker for severe disease and poor prognosis, rather than nutritional state. Many surgeons desire an albumin level higher than 3 g/dL before they operate. However, protein levels in IBD patients with severe inflammation tend to stay low due to ongoing losses and stress metabolism until the diseased bowel is removed, no matter how many extra calories or protein the patient is given. In these patients, aggressive medical therapy and/or surgery is needed to get the patient on the road to recovery; prolonged nutrition support is not going to be helpful, and it is sometimes harmful due to the risk of line infections or other consequences that can result from parenteral nutrition.

G&H What are the benefits of parenteral nutrition in patients with IBD?

CES The desired benefits are to improve wound healing, prevent anastomotic leaks, and limit the weight loss that

occurs when patients are without oral caloric intake for a prolonged period before or after surgery. Studies in IBD patients show a correlation between a low albumin level and a higher chance of poor wound healing or anastomotic leaks. However, there are no evidence-based studies to provide guidance as to how long nutritional repletion should occur. Thus, the benefits of parenteral nutrition are somewhat theoretical, and no studies have shown that parenteral nutrition affects mortality.

G&H What are the risks of preoperative parenteral nutrition?

CES There are 2 main risks of parenteral nutrition. First, the rich nutrients that are infused into a central venous catheter increase a patient's risk for line infection, which can lead to sepsis. The second risk, a concern in patients with IBD or other inflammatory diseases that cause a hypercoagulable state, is catheter-related venous thrombosis. In addition, there is a risk of hyperglycemia in those on steroids and electrolyte abnormalities—in particular potassium, magnesium, and phosphorus depletion—in those with severe malnutrition who are refeeding (refeeding syndrome).

G&H What are the contraindications for parenteral nutrition?

CES The only true contraindication is a reported allergic reaction to parenteral nutrition. Such a reaction can occur if a patient is allergic to eggs, as traces of egg are present in the lipid component of parenteral nutrition. Other components of the lipid emulsion or preservatives present in additives (electrolyte or vitamin/mineral/trace elements) may also cause an allergic reaction. When individuals present with severely depleted levels of potassium, magnesium, or phosphorus, or with electrolyte disarray, repletion or correction is warranted before starting parenteral nutrition.

G&H What alternatives are available for patients who do have allergies?

CES Patients are never allergic to the amino acid or dextrose components of the formula. Thus, clinicians can start parenteral nutrition by giving the patient the sugar and amino acids but omitting the lipid and additives (vitamins, minerals, and trace elements). A skin test can then be performed to determine which component is triggering the allergy, and clinicians can tailor the patient's parenteral nutrition formula accordingly. If the allergy is only to the electrolyte component, additives without preservatives are sometimes available. If the allergy is to the vitamin/mineral component, the clinician might be able to give those nutrients orally and give the amino acid, dextrose, and lipid parenterally. If the allergy is to the lipid component, essen-

tial fatty-acid deficiency may occur after 2 weeks without lipids in parenteral nutrition. The only option is to give lipids orally or rubbed on the skin. New lipid emulsions have been developed that may get around this problem, but they are not yet available in the United States.

G&H Does the parenteral nutrition formula given to IBD patients differ from the formula given to other patients?

CES No, the same ingredients are given. However, patients with IBD tend to have high protein loss from ulcerations in the bowel, so the amount of protein in their formula is likely to be higher (1.5 g/kg dry body weight) than for someone who requires parenteral nutrition due to simple starvation without protein loss. Patients with IBD may also require more zinc and magnesium, as these nutrients can be lost due to diarrhea.

G&H Have any studies examined the association between parenteral nutrition and surgical outcomes in patients with IBD?

CES There are no large randomized outcome studies focusing exclusively on parenteral nutrition in IBD patients. Thus, there are no data on nutrition support during the preoperative or perioperative period and disease recurrence, rates of wound healing, or anastomotic leaks. Studies to date have not shown an improvement in morbidity or mortality with parenteral nutrition support in surgical patients, except in severely malnourished patients.

G&H When would parenteral nutrition be indicated following IBD surgery?

CES Following surgery, the need for parenteral nutrition depends on nutrition status and the amount of time before the patient can eat or be fed enterally, as either of those alternatives is preferred over parenteral nutrition. Patients who are severely malnourished and cannot eat or be tube fed before surgery should receive parenteral nutrition throughout the preoperative and postoperative periods until their gut is functional. For patients who are mildly or moderately malnourished, clinicians can delay the start of parenteral nutrition for 7–10 days and try to get patients to eat on their own. When a patient has very little small intestine remaining following surgery (short bowel syndrome), parenteral nutrition needs to be started immediately along with medical and dietary therapy. It often takes 1–2 years for maximal bowel adaptation (hyperplasia and bowel elongation/dilation) and determination of whether life-long parenteral nutrition is needed. Fistulizing disease involving the distal small bowel requires parenteral nutrition until healing or surgery.

G&H How long do patients typically stay on parenteral nutrition?

CES The duration of parenteral nutrition depends on the type of surgery and the patient's underlying condition. In an IBD patient with an anastomotic leak following surgery, reoperation is usually performed immediately or 3 months later; in the later case, parenteral nutrition is needed. For resection of a segment of diseased or stenosed small bowel, patients can often start eating within 3–5 days of the surgery and never require parenteral nutrition.

G&H Do the risks and benefits of parenteral nutrition following surgery differ from the risks and benefits of preoperative parenteral nutrition?

CES No, the risks are the same: central line infection and catheter-related venous thrombosis. The risk of line infection increases with the number of times the catheter is entered and the duration of parenteral nutrition.

G&H Do patients have any special nutritional needs following surgery?

CES The patient's nutritional needs depend on the type of surgery. For instance, if the patient has undergone a complete colon resection and an ileostomy, then absorption of fluid and electrolytes becomes a major consideration in the immediate postoperative period, as the colon absorbs about 1.5 L of the 6–8 L that pass through the bowel daily. Individuals with an ileoanal pouch, particularly those with pouchitis, are at risk for vitamin B₁₂, iron, fat, and zinc deficiencies. Patients with ileal resections longer than 60 cm malabsorb vitamin B₁₂, and those with ileal resections longer than 100 cm malabsorb fat and fat-soluble vitamins. Therefore, vitamins B₁₂, A, E, and D need to be monitored and supplemented. When a large amount of small bowel is resected, all nutrients will be absorbed poorly.

G&H How is nutrition managed once patients discontinue parenteral nutrition?

CES Ongoing nutrition assessment is an important consideration. Patients tend to be followed intensively when they are sick and surgery is planned; however, once patients start to recover, sometimes there is a loss of attention to vitamins and minerals. Clinicians need to keep track of the location and amount of small bowel that is resected as well as medicines that IBD patients are taking postoperatively, as these factors can impact on the risk for vitamin and mineral deficiencies following surgery.

There are no standard guidelines regarding how often to monitor nutrition status in IBD patients or which vitamins and minerals to monitor; these decisions depend on what

part of the bowel was resected and whether the patient has a pouch or an ileostomy. I think it is prudent to follow up with a patient 1–3 months after parenteral nutrition support is discontinued to get a sense of what vitamin or mineral deficiencies may develop so they are prevented, rather than having to replete these nutrients later. All patients with IBD are at risk for metabolic bone disease, so follow-up of their bone health is very important. They are also at risk for the development of kidney stones, particularly those with a distal small bowel resection and colon remaining. A low-fat, low-oxalate diet with calcium supplementation is warranted in such patients. These preventative measures are very important to keep IBD patients healthy.

G&H What additional research is needed in this area?

CES Many studies are needed. One of the major areas of study right now is the optimal lipid emulsion to use in IBD patients who require parenteral nutrition. Lipid emulsions made from olive or fish oil may be anti-inflammatory and beneficial. A second area of research is to determine whether preoperative and postoperative parenteral nutrition is beneficial in IBD patients who are mildly or moderately malnourished. While studies have shown that parenteral nutrition is beneficial for patients who are severely malnourished, there is no evidence to support the use of parenteral nutrition in patients with mild or moderate malnutrition. Studies need to examine IBD patients separately from other types of surgical patients. Third, some researchers are exploring the idea of immunonutrition in IBD, which proposes the addition of arginine or glutamine to standard nutrition to enhance bowel recovery. Finally, more information is needed to answer the question of whether enteral nutrition can be used to control disease. Putting individuals on elemental tube feeding during the preoperative period when their disease is highly active might damp inflammation and improve surgical outcomes, but this needs to be studied further.

Suggested Reading

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