

Management of Iron Deficiency Anemia in the Patient with Inflammatory Bowel Disease and in Post-Bariatric Surgery Patients

Prevalence of Anemia in Inflammatory Bowel Disease (IBD)

Ulcerative colitis and Crohn's disease are frequently associated with anemia. Reported rates vary widely, but at least one-third of patients with IBD have anemia. Iron is a component not only of hemoglobin but of myoglobin and cytochromes and many other enzymes as well. Patients with IBD may suffer from many non-specific symptoms such as fatigue, malaise, weakness, breathlessness, nausea, irritability, poor concentration or even depression, that may be related to iron deficiency. Quality of life for anemic patients with Crohn's disease is reported to be comparable to that of patients with advanced cancer. Correction of chronic anemia and iron deficiency has significant benefits in terms of quality of life.¹

What Causes Iron Deficiency Anemia in People with IBD?

There are different reasons why anemia occurs in people with IBD. The most common cause is blood loss from the intestines. Another cause is a reduced level of iron in the diet, as people with IBD may have to follow a restrictive diet and may have problems absorbing enough iron from the gut due to inflammation.^{2,3} Reduced absorption may also be a result of bowel resection surgery due to Crohn's or UC; 30-40% of UC patients and 70-80% of CD patients require some type of surgery in their lifetime as a result of IBD.⁴

Iron balance in the body is usually achieved through control of the amount of iron absorbed from the intestines.² If iron stores are low, the intestines usually absorb more iron from food to increase these stores. However, in people with IBD, the amount of iron absorbed can be impaired.²

Inflammation is the major cause of reduced availability of iron. During episodes of inflammation, the transport and

storage of iron can be affected.^{1,2} This can result in less iron being available to produce red blood cells, resulting in iron deficient erythropoiesis or "functional" iron deficiency.

Other causes of anemia in people with IBD

People with ulcerative colitis or Crohn's disease may also be diagnosed with vitamin deficiency anemia or drug-induced anemia or combination anemias, although these forms are much less common than iron deficiency anemia.

Vitamin deficiency anemia is most often caused by inadequate absorption of vitamin B12 and folic acid from the diet.^{5,6} Although rare, drug-induced anemia can be caused by certain antibiotics⁶ or anti-inflammatory drugs. In summary, anemia in IBD is a complex model of iron deficiency, inflammation, malabsorption, intestinal resection, and blood loss all contributing to iron deficiency. The severity and activity of the underlying disease process is correlated with the probability of iron deficiency; therefore, the prevalence is highest in referral hospitals and inpatients. Iron deficiency is not synonymous with anemia, and the management goal in this patient population is not simply correcting the anemia but correcting the iron deficiency as well.¹

Treatment of Iron Deficiency in Inflammatory Bowel Disease

The first goal is to achieve clinical remission or, at a minimum, the maximum reduction in disease activity that is possible. While oral iron has been used to treat iron deficiency in IBD, it is far from ideal. Even when oral iron is tolerated, the hemoglobin response is significantly less than that seen with parenteral iron. Only a fraction of the enteric dose is absorbed, and the luminal iron that remains can be toxic for the mucosa and increase inflammation. Parenteral iron is well tolerated and has no influence on mucosal lesions.⁷ The choice of parenteral iron product is not critical. However, use of ferric carboxymaltose, ferumoxytol or low molecular weight iron dextran will limit the number of doses required to replete iron stores and correct anemia compared to iron sucrose or iron gluconate. 50-80% of patients can be expected to achieve their hemoglobin

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target with IV iron alone; addition of erythropoietin in refractory cases may be useful.⁸

In summary, parenteral iron to achieve normal iron stores and a near normal hemoglobin should be considered in all patients with IBD. While there is still disagreement, many authors feel oral iron should always be avoided in IBD patients.

Anemia after Bariatric Surgery Surgical Procedures for Weight Loss

Morbid obesity is one of the most common causes of illness and death in the United States. In the next twenty years it is anticipated that 40% of the population will be obese with a Body Mass Index (BMI) greater or equal to 30.¹¹

Surgery has become an effective way to achieve lasting weight control and a healthy body weight. Surgical procedures for morbid obesity like gastric banding, laparoscopic sleeve gastrectomy, and the Roux-en-Y gastric bypass (RYGB, the most widely performed procedure), are all bariatric surgical procedures.⁷

Nutritional deficiency problems have been observed in patients after gastric bypass surgery.^{12,13} Iron absorption is impaired due to the changes in the gastrointestinal (GI) anatomy, reduction in acid secretion and reduction in the absorptive surface area. Greater than 50% of patients who have undergone sleeve gastrectomy, or a Roux-en-Y bypass, will experience iron deficiency.¹⁴ Decreased iron intake, GI bleeding, or bleeding after the surgical procedure itself increases the risk for a patient developing iron deficiency anemia. Obesity itself is a pro-inflammatory state and can interfere with iron absorption. Therefore, many bariatric surgery patients are anemic and iron deficient even before surgery. Dietary limitations, early satiety, and calorie restrictions after surgery can decrease dietary intake of iron and other micronutrients. Reduced tolerance to red meat is common in 20-50% of post-bariatric surgery patients.

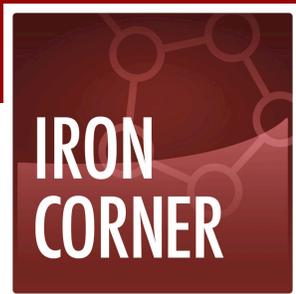
Preventive strategies as well as effective treatment options for iron deficiency are crucial to managing iron status in patients before and after bariatric surgery.¹⁴

Evaluation for iron deficiency should include at least transferrin saturation and serum ferritin. Inflammatory markers such as CRP may be of value. Soluble transferrin receptor concentration can help differentiate functional and true iron deficiency. Intravenous iron replacement is the treatment of choice for post-bariatric surgery patients with iron deficiency, with the dose dependent on the degree of anemia and iron deficiency. Oral iron replacement is usually poorly tolerated, and absorption is limited for the reasons previously described. 1,000 -2,000 mg is usually sufficient to replenish iron stores for a year –and is safe, tolerated, efficient and effective.¹⁵

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