

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

Summary

- Iron deficiency and iron deficiency anemia may affect a significant proportion of individuals with inflammatory bowel disease (IBD) and those who have undergone bariatric surgery.
 - IV iron is preferred for the following reasons:
 - Many individuals with IBD have severe intolerance to oral iron preparations, which may also worsen IBD disease activity.
 - Individuals with IBD may have ongoing inflammation and/or malabsorption that may interfere with iron absorption, and IV iron is better able than oral iron to partially overcome the iron-restricted erythropoiesis associated with inflammation.
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Causes and Prevalence of Anemia in Inflammatory Bowel Disease

Ulcerative colitis (UC) and Crohn's disease are frequently associated with anemia. Iron deficiency is the most common cause of anemia due to malabsorption, blood losses and the associated release of cytokines that lead to anorexia and impaired iron regulation. 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. 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.³ These surgeries typically involve resection of the terminal ileum which is the site of B12 production and can lead to both iron and B12 deficiency.

Reported rates vary widely, but at least one-third of patients with IBD have anemia. 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

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 Disease⁹

While oral iron has been used to treat iron deficiency in IBD, many individuals with IBD have severe intolerance to oral iron preparations, which may worsen IBD disease activity. In a retrospective review of 277 individuals with IBD who were treated with oral iron, intolerance to therapy was seen in one-fourth.⁴ 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.⁵ 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 target with IV iron alone; addition of erythropoietin in refractory cases may be useful.⁶

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 30.⁷

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.

Nutritional deficiency problems have been observed in patients after gastric bypass surgery.^{8,9} 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.¹⁰ 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.¹⁰

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.¹¹

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