

Common Micronutrient Deficiencies in IBD

Educational Resource for Healthcare Providers

Inflammatory Bowel Disease (IBD) patients are at risk for micronutrient deficiencies as a result of active bowel inflammation, food avoidance, and medical or surgical treatments. The most common micronutrient deficiencies in IBD are listed in the table below. These deficiencies can increase risk for bone disease, cognitive decline, anemia, arterial and venous thromboembolism, poor growth, and other complications.

Most IBD patients should take a multiple vitamin with minerals daily (caution in those with liver or renal impairment); consider chewable or liquid form for better absorption for patients with more severe disease. Adequate intake of calcium and supplementation with vitamin D is important for all patients with IBD, especially if on high dose or long term steroids, or if avoiding dairy products. Consider water-miscible A, D, E, K if on cholestyramine, or if fat malabsorption present.

Micronutrient	Signs of deficiency	Risk factor for deficiency	Biochemical Assessment	Recommended replacement for deficiency
Calcium	Hypotension, prolonged QT interval, distal extremity paresthesias, Chvostek sign, Trousseau sign, muscle cramps, tetany, seizures ²	Vitamin D deficiency, decreased PTH activity, ² corticosteroid use	Serum calcium does not fluctuate with changes in calcium intake ³	Gender and age specific: <ul style="list-style-type: none"> • 9-18 yrs: 1300 mg • 19-50 yrs: 1000 mg • 51-70 yrs: 1000 mg (male), 1200 mg (female) • 71+ years: 1200 mg³
Cobalamin (B12)	Cognitive decline, cardiovascular disease, bone fractures; megaloblastic anemia with macrocytosis; glossitis, constipation, diarrhea; hand/feet paresthesia; confusion, poor memory ²	Crohn's disease affecting the terminal ileum; ileal resection >20cm; significant gastric resection; small intestinal bacterial overgrowth (SIBO); vegetarian diet	High serum Methylmalonic Acid, low plasma or serum B12, elevated MCV	oral B12 supplementation >1000 mcg daily; ⁴ Prophylaxis: IM B12 1000 mcg monthly with >60cm ileum resected ⁵
Vitamin D	Hypocalcemia, osteomalacia, osteoporosis ²	Malabsorptive disorders, small intestinal bacterial overgrowth (SIBO), corticosteroid use	25-(OH)D <20 ng/mL deficiency; 25-(OH)D <21-29 ng/mL insufficiency	If level<20: 50,000 IU D2 ⁵ or D3 for 12 weeks; ^{6,7} re-check levels and continue supplementation if still deficient. Maintenance dose of 1500-2000 IU/d D3; ⁷ higher maintenance doses of 3000-6000 IU/d are recommended for patients on glucocorticoids, anticonvulsants, those with malabsorption, ⁶ BMI >30, or in those with small bowel involvement ⁷

Micronutrient	Signs of deficiency	Risk factor for deficiency	Biochemical Assessment	Recommended replacement for deficiency
Folate (B9)	Megaloblastic, macrocytic anemia; diarrhea, smooth, sore tongue; weight loss; nervous instability; dementia ²	GI resections; patient on restrictive diet; use of sulfasalazine, methotrexate, cholestyramine; achlorhydria; small intestinal bacterial overgrowth (SIBO)	Low plasma or serum folate (will be elevated if +SIBO), elevated MCV and homocysteine, low red blood cell folate	1 mg folic acid daily ⁴
Iron	Microcytic, hypochromic anemia; tachycardia; poor capillary refill, fatigue, sleepiness, headache, anorexia, nausea, pallor, impaired behavioral performance ²	GI bleeding, UC, achlorhydria, small intestinal bacterial overgrowth (SIBO)	Hb 10-12 g/dL (women), 11-13 g/dL (men); Serum ferritin <100 ng/mL, transferrin saturation <20%, elevated transferrin receptor levels	In inactive IBD/normal CRP: 100 mg oral iron daily in divided doses. Additional vitamin C may help enhance iron absorption. In active IBD, chronic iron deficiency anemia, Hb <10 g/dL (women), <11 g/dL men: consider parenteral iron. ⁸
Magnesium	Neuromuscular hyperexcitability, latent tetany, frank seizures, arrhythmias	Chronic or severe acute diarrhea, short gut	Low serum magnesium	150 mg elemental Mg four times daily ⁴
Pyridoxine (B6)	Seborrheic dermatitis, microcytic anemia, confusion, depression, angular stomatitis, glossitis, cheilosis ²	Restrictive diets, poor oral intake, corticosteroid or isoniazid use	Low mean plasma pyridoxal-5-phosphate (PLP) concentration	50-100 mg/day ⁵ OR 10 to 20 mg/day IM or IV for 3 wk; then 2 to 5 mg/day ORALLY for several wk.
Zinc	Inadequate growth, acrodermatitis enteropathica, hypogonadism, impaired night vision, anorexia, diarrhea alterations in taste and smell, alopecia, impaired wound healing ²	PPI/H2 blockers, protein deficiency, malabsorptive disorders, diarrhea, fistulizing disease; vegetarian diet	Low plasma or serum zinc	50 mg elemental zinc ⁴ for 10 days. Caution copper deficiency for those on long term zinc supplementation.

Patient education resources:

The following links contain brochures and webcasts for patients on topics such as diet, nutrition, treatment, and more:

 online.cdfa.org/brochures

 www.cdfa.org/resources/webcasts.html



References:

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6. Holick, M. F., et al. Journal of Clinical Endocrinology & Metabolism. 2011; 96(7), 1911-30.
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