



## SESSION (3)

# Dietary Therapy for IBD: Food for Thought

## Vitamin D in IBD

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### What is the evidence for the use of Vitamin D in IBD?

Vitamin D is a critically essential nutrient for all people, irrespective of the presence of inflammatory bowel disease (IBD). Vitamin D is produced by the action of sunlight on the skin, which converts 7-dehydrocholesterol to cholecalciferol, or vitamin D3.

In northern climates, cold temperatures reduce exposure to sunlight during late fall, winter, and early spring, resulting in widespread vitamin D deficiency or insufficiency, especially in ethnic groups with pigmented skin. In food, vitamin D is present as D3, or as ergocalciferol (vitamin D2). Vitamin D3 or D2 is hydroxylated in the liver to 25-hydroxyvitamin D, the level of which is used to determine deficiency. 25-hydroxyvitamin D is converted into the active 1,25-dihydroxyvitamin D by the kidney and is regulated by plasma parathyroid hormone levels.<sup>1</sup>

**Diagnosis of deficiency:** The levels of 25-hydroxyvitamin D needed to provide a nadir plateau of parathyroid hormone levels and maximal intestinal transport of calcium is considered to be the level of vitamin D sufficiency. Using these criteria, deficiency is defined as a level <50 nmols/L, insufficiency 52-72 nmol/L, and sufficiency >75 nmol/L.<sup>2</sup>

**Vitamin D deficiency and insufficiency in IBD:** In a Canadian study of 242 patients, 22% of patients had levels <40 nmol/L (deficiency), but there were no case controls.<sup>3</sup> A case-controlled study of pediatric patients with IBD found no difference in the overall levels of vitamin D between patients with IBD and controls, but patients with IBD, who had an elevated erythrocyte sedimentation rate, had significantly lower levels.<sup>4</sup> In this study,<sup>4</sup> however, and in adult patients in the US<sup>5</sup> and Canada,<sup>6</sup> the majority of patients had insufficient levels of vitamin D, as defined above.

**Vitamin D and inflammation:** The active form of vitamin D, 1,25-dihydroxyvitamin D, promotes T-helper and regulatory responses and induces cytokines, which suppresses inflammation.<sup>7</sup> In humans, normalization of vitamin D levels has been shown to reduce the risk of relapse and surgery<sup>7</sup> and improve quality of life.<sup>8</sup>

### When and how should replacement take place?

The recent endocrine society clinical practice guidelines<sup>9</sup> recommend that high-risk persons, which includes patients with IBD and those with pigmented skin, should be screened for vitamin D deficiency or insufficiency. The guidelines recommend that deficient persons be given 50,000 IU weekly, or 6000 IU/day, for 8 weeks and then monitored until blood levels >75 nmol/L.<sup>9</sup> Maintenance with a supplement of 1500-2000 IU per day is recommended. An alternative maintenance regimen, followed over a 6-year period, was the administration of 50,000 IU on alternate weeks.<sup>10</sup> To support these recommendations in patients with IBD, a controlled trial in children and adolescents was performed.<sup>11</sup> Administration of 2000 IU per day of vitamin D2 did not normalize deficiency, 2000 IU of D3 per day resulted in a mean subnormal level of ~32 nmol/L, and only 50,000 IU per week of Vitamin D2 resulted in a mean level of ~60 nmol/L.

These recommendations are for patients with normal absorption. For patients with varying degrees of malabsorption, the dose has to be titrated up, and levels measured for 2 months, until blood levels >75 nmol/L. In my experience, patients with varying degrees of resection require supplementation levels ranging from 50,000 IU weekly to 50,000 IU on alternate days to normalize vitamin D levels.



## References

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