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Vitamin D Found to Benefit Digestive Health

By Greg Arnold, DC, CSCS, January 31, 2010, abstracted from "Direct and indirect induction by 1,25-dihydroxyvitamin D3 of theNOD2/CARD15-beta defensin 2 innate immune pathway defective in Crohn's disease" printed online in the Journal of Biological Chemistry

Link - http://www.nowfoods.com/078502.htm

Crohn's Disease is defined as "an ongoing disorder that causes inflammation of the digestive tract" (1). It was named after Dr. Burrill B. Crohn, due to a paper published in 1932 in which Dr. Crohn and two colleagues described the features of what became known as Crohn's disease. Crohn's and a related disease, ulcerative colitis, are the two main disease categories that belong to a larger group of illnesses called inflammatory bowel disease (2).

An estimated one million Americans suffer from Crohn's Disease, with seven new cases of Crohn's disease per 100,000 people per year (3), costing our healthcare system $12,417 per patient per year (4). Nutrition, including probiotics and prebiotics (5) and stinging nettle (6), plays a role in digestive health. Now a new lab study (7) has suggested that vitamin D may help with digestive health.

In the study, the researchers found that vitamin D affects activity of a gene called NOD2, which "plays an important role in recognizing the presence of bacteria and inciting an immune response" (8). An insufficiency of this gene's activity "contributes to development of [Crohn's Disease]" (9).

Specifically, researchers exposed human white blood cells called THP-1 (10) to an inflammatory fat called LPS to simulate Crohn's Disease. They then added vitamin D in two different concentrations that created either a vitamin D-deficient environment (10 nanoMolar) or a vitamin D-sufficient environment (100 nM). They found that NOD2 activity in the vitamin D-sufficient environment "strongly stimulated" NOD2 activity while NOD2 activity in the vitamin D-deficient environment was "substantially less effective". Specifically, NOD2 activity was more than triple in the vitamin D-sufficient environment.

Vitamin D may also stimulate an anti-bacterial environment in the digestive tract through its action on a protein called Cyclic AMP, known to function as an antibiotic (11). Specifically, Cyclic AMP activity in the Vitamin D-sufficient environment was more than 10-fold higher than in the vitamin D-deficient environment.

For the researchers, "Our observation hat [vitamin D] signaling is a direct inducer of NOD2 expression argues strongly that vitamin D insufficiency/deficiency does play a causative role in the prevalence of CD."

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