Literature Review & Commentary

by Alan R. Gaby, MD
drgaby@earthlink.net

Colon-Release Propionyl-L-Carnitine for Ulcerative Colitis

One hundred twenty-one patients (ages 18 to 75 years) with mild-to-moderate ulcerative colitis (disease activity index of 3 to 10, with lower numbers indicating less severe disease) were randomly assigned to receive, in double-blind fashion, a colon-release preparation of propionyl-L-carnitine or placebo for 4 weeks. The dosage was 500 or 1000 mg twice a day orally, 1 hour before breakfast and 1 hour before dinner. All patients had been receiving stable aminosalicylate or thiopurine therapy, and continued to receive this therapy during the trial. The primary endpoint was clinical/endoscopic response (defined as a decrease of at least 3 points in the disease activity index score) or remission (defined as a disease activity index score of 2 or less, with no individual subscore greater than 1). After 4 weeks, the proportion of patients who experienced a clinical/endoscopic response was significantly greater in the combined propionyl-L-carnitine groups than in the placebo group (72% vs. 50%; $p = 0.02$). Response rates were similar in the two propionyl-L-carnitine groups, with no trend suggesting that the higher dose was more effective. The remission rate was also higher in the propionyl-L-carnitine group than in the placebo group (52% vs. 35%), but the difference was not statistically significant. No serious side effects were reported, and the side effect profile of propionyl-L-carnitine was similar to that of placebo. The most common side effects were gastrointestinal.

Comment: One of the biochemical abnormalities associated with ulcerative colitis is impaired oxidation of fatty acids, which could lead to decreased mitochondrial energy production. L-carnitine enhances fatty acid oxidation by facilitating the transport of fatty acids into mitochondria, and might therefore be beneficial for people with ulcerative colitis. However, because 70% of the energy used by colon cells is derived directly from the colonic lumen, providing L-carnitine directly to the colon (by administering a colon-release oral preparation) might be more effective than standard oral administration. Propionyl-L-carnitine is a derivative of L-carnitine that has been used successfully in the treatment of various L-carnitine-responsive disorders, such as intermittent claudication and angina pectoris. The results of the present study suggest that colon-release propionyl-L-carnitine is effective as an adjunct to conventional medication in patients with ulcerative colitis. Colon-release propionyl-L-carnitine is available from Ecological Formulas (Concord, CA).

Mikhailova TL et al. Randomised clinical trial: the efficacy and safety of propionyl-L-carnitine therapy in patients with ulcerative colitis receiving stable oral treatment. *Aliment Pharmacol Ther*. 2011;34:1088–1097.

Vitamin D Slows Progression of Type 1 Diabetes

Thirty-eight Brazilian patients (mean age, 13 years) with new-onset type 1 diabetes and a fasting C-peptide level $\geq$ 0.6 ng/ml (indicating significant residual beta-cell function) were randomly assigned to receive, in double-blind fashion, 2000 IU per day of vitamin D or placebo for 18 months. All patients received insulin as needed. The proportion of patients who progressed to having undetectable fasting C-peptide levels ($\leq$ 0.1 ng/ml) was significantly lower in the vitamin D group than in the placebo group (18.7% vs. 62.5%; $p = 0.01$). The proportion of patients who progressed to having undetectable stimulated C-peptide levels was also significantly lower in the vitamin D group than in the placebo group (6.2% vs. 37.5%; $p < 0.05$). Compared with placebo, vitamin D supplementation resulted in a protective immunologic profile (as determined by levels of pro-inflammatory and anti-inflammatory cytokines, chemokines, and regulatory T cells). No adverse effects or abnormalities of standard laboratory tests were observed.

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