

L-Carnitine Benefits Patients with Hypothyroidism

by Becky | Sep 22, 2016 | 2016, Amino Acids, Carnitine, Thyroid

Written by Greg Arnold, DC, CSCS. Twelve weeks of supplementation with 1980 mg of L-carnitine significantly improved physical fatigue levels by 22.9% in participating subjects when compared to control.

Hypothyroidism, a condition in which the thyroid gland doesn't produce enough thyroid hormone, is estimated to affect as many as 1 in 20 Americans (1, 2, 3). And although thyroid medications such as levothyroxine have been shown to help normalize thyroid hormone levels, fatigue is still a significant complaint (4, 5). As a result, finding adjunctive treatments to help with fatigue in those with hypothyroidism is needed.

L-Carnitine is known to increase fat-burning ("fat oxidation") and energy levels in patients with conditions ranging from peripheral vascular disease to heart failure and kidney problems (6, 7, 8). Research has started to suggest that L-Carnitine may also be a benefit to those with hypothyroidism.



A 2016 study (9) involved 63 patients (6 males, 57 females) aged 41 to 59 with hypothyroidism (defined as having a fatigue severity scale ≥ 36 (10)). They were given either 1980 milligrams of L-carnitine per day (taken as 990 mg twice daily as has been used in previous studies (11, 12) = 28 subjects) or a placebo (25 subjects) for 12 weeks. Before and after the study, each subject provided blood samples and also completed a fatigue severity scale and the Wessely and Powell scale that includes a physical fatigue score and mental fatigue score (25).

After 12 weeks across the entire set of subjects, mental fatigue showed a statistically significant decrease, with a 13.4% decrease in the L-carnitine group (4.5 to 3.9) compared to a 9.5% increase in the placebo group (4.2 to 4.6, $p < 0.01$). While decreases in fatigue severity and physical fatigue were greater in the L-carnitine group versus the placebo group, statistical significance wasn't reached ($p > 0.05$).

What was also statistically significant was the benefit of L-carnitine supplementation for specific subgroups of subjects. Specifically:

- Those under the age of 50 had a statistically significant improvement compared to the placebo group in both physical fatigue (3.1 versus 1.0-point decrease ($p < 0.05$)) and mental fatigue (1.0-point decrease versus 0.4-increase ($p < 0.05$)). Before and after data was not provided with these subgroups so overall % increase/decrease could not be calculated.
- Subjects over the age of 50 and blood levels of a type of thyroid hormone ("Free T3") over 4 picograms/milliliter had a 5.1-point decrease in their physical fatigue scores compared to a 0.1-point decrease in the placebo group ($p < 0.05$). Before and after data was again not provided so overall % increase/decrease could not be calculated in this subgroup.

For the researchers, "To our knowledge, this is the first report to show that L-carnitine may be useful in alleviating fatigue symptoms in hypothyroid patients" and that "Given the relatively high prevalence of hypothyroidism in the general population and rapidly increasing number of patients with postoperative hypothyroidism due to thyroid cancer, we believe that the results of our study have important implications for these patients." However, beginning research such as this would be more significant if corroborated by other laboratories.

Source: An JH. L-carnitine supplementation for the management of fatigue in patients with hypothyroidism on levothyroxine treatment: a randomized, double-blind, placebo-controlled trial. *Endocr J* 2016 Jul 16. [Epub ahead of print]

Posted September 22, 2016.

Greg Arnold is a Chiropractic Physician practicing in Hauppauge, NY. You can contact Dr. Arnold directly by emailing him at PitchingDoc@msn.com or visiting his web site at www.PitchingDoc.com.

References:

1. Wang C, Crapo LM (1997) The epidemiology of thyroid disease and implications for screening. *Endocrinol Metab Clin North Am* 26: 189-218
2. Bjoro T, Holmen J, Kruger O, Midthjell K, Hunstad K, et al. (2000) Prevalence of thyroid disease, thyroid dysfunction and thyroid peroxidase antibodies in a large, unselected population. The Health Study of Nord-Trondelag (HUNT). *Eur J Endocrinol* 143: 639-647
3. Hollowell JG, Staehling NW, Flanders WD, Hannon WH, Gunter EW, et al. (2002) Serum TSH, T(4), and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III). *J Clin Endocrinol Metab* 87: 489-499
4. Saravanan P, Chau WF, Roberts N, Vedhara K, Greenwood R, et al. (2002) Psychological well-being in patients on 'adequate' doses of l-thyroxine: results of a large, controlled community-based questionnaire study. *Clin Endocrinol (Oxf)* 57: 577-585
5. Wekking EM, Appelhof BC, Fliers E, Schene AH, Huyser J, et al. (2005) Cognitive functioning and wellbeing in euthyroid patients on thyroxine replacement therapy for primary hypothyroidism. *Eur J Endocrinol* 153: 747-753
6. Duranay M, Akay H, Yilmaz FM, Senes M, Tekeli N, et al. (2006) Effects of L-carnitine infusions on inflammatory and nutritional markers in haemodialysis patients. *Nephrol Dial Transplant* 21: 3211-3214
7. Rizos I (2000) Three-year survival of patients with heart failure caused by dilated cardiomyopathy and L-carnitine administration. *Am Heart J* 139: S120-123
8. Brevetti G, Chiariello M, Ferulano G, Policicchio A, Nevola E, et al. (1988) Increases in walking distance in patients with peripheral vascular disease treated with L-carnitine: a double-blind, cross-over study
9. An JH. L-carnitine supplementation for the management of fatigue in patients with hypothyroidism on levothyroxine treatment: a randomized, double-blind, placebo-controlled trial. *Endocr J* 2016 Jul 16. [Epub ahead of print]
10. Krupp LB, LaRocca NG, Muir-Nash J, Steinberg AD (1989) The fatigue severity scale. Application to patients with multiple sclerosis and systemic lupus erythematosus. *Arch Neurol* 46: 1121-1123
11. Malaguarnera M, Cammalleri L, Gargante MP, Vacante M, Colonna V, et al. (2007) L-Carnitine treatment reduces severity of physical and mental fatigue and increases cognitive functions in centenarians: a randomized and controlled clinical trial. *Am J Clin Nutr* 86: 1738-1744
12. Malaguarnera M, Vacante M, Avitabile T, Malaguarnera M, Cammalleri L, et al. (2009) L-Carnitine supplementation reduces oxidized LDL cholesterol in patients with diabetes. *Am J Clin Nutr* 89: 71-76.