A Case Study of L-Carnosine for Patient-Reported Outcomes and Brain Metabolism in Multiple Sclerosis

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Objectives: This case trial reports the effects of L-carnosine supplementation on neuromuscular performance, brain metabolism, and various patient- and clinician-reported outcomes in a case series of patients with multiple sclerosis (MS).

Methods: Two women (aged 37 and 48) and a man (age 48 years) who fulfilled the 2017 McDonald criteria for MS diagnosis, and were free of other major chronic diseases or acute disorders were recruited for this case study. The duration of illness was 4 years in CASE 1 (37-year old women), 5 years in CASE 2 (48-year old men), and 15 years in CASE 3 (48-year old women). L-carnosine (2 g/day) was administered orally during 8 weeks in all MS patients. The trial was registered at ClinicalTrials.gov (ID NCT03995810).

Results: The intensity of symptoms and signs of MS after L-carnosine administration diminished in 5 out of 7 domains in CASE 1, in 3 out of 7 domains in CASE 2, and one domain in CASE 3; general fatigue has been reduced in all three cases at the follow-up. The Visual Analog Scale scores for numbness, weakness, pain, and depression decreased in all MS patients at post-administration. This was accompanied by an improved walking distance to exhaustion in all patients, with values improved for 51.1% in CASE 1, 19.5% in CASE 2, and 2.1% in CASE 3 at 8-week follow-up. An increase in serum total antioxidant capacity was found at 8-week follow-up in all patients (from 4.6 to 49.6%); this was accompanied by lower blood lactates at follow-up in all cases (23.5% on average). Single-voxel 1.5 T MRS revealed an increased brain choline-contained compounds (18.9% on average), total creatine (21.2%), and myo-inositol levels (12.3%) in girus cinguli at 8-week follow; this was accompanied by a drop in brain glutamate for 22.6% on average.

Conclusions: This case report suggests the favorable effects of medium-term L-carnosine as a possible adjuvant treatment to improve selected patient- and clinician-reported outcomes in a man and two women suffering from MS. There is a need for larger and more rigorous human intervention studies to corroborate these preliminary findings.

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