Medium-Term Carnosine Supplementation Positively Affects Patient-Reported Outcomes in Multiple Sclerosis

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ABSTRACT

Multiple sclerosis (MS) is a potentially disabling autoimmune disease of the central nervous system, with a rather uncertain prognosis and no cure. Supplemental carnosine seems to be beneficial for balancing contractile function and reducing fatigue while these functions are altered in MS; however, the effects of carnosine as an element of management of MS remain unclear. **PURPOSE:** In this preliminary study, we evaluated the effects of medium-term carnosine administration on Multidimensional Fatigue Inventory (MFIS) and Short Form Survey Instrument (SF-36) in adult patients with MS. **METHODS**: During 2018 (from March to November) 51 patients with MS (age 44.9 ± 8.4 years; 15 men and 36 women) were recruited and examined by a certified health care professional. All patients were allocated to an open-label treatment trial with supplemental carnosine (500mg/day) administered during the four months, with patients evaluated at baseline and at post-intervention follow-up. **RESULTS:** A total MFI score dropped after carnosine intervention (64.1 ± 19.1 at baseline *vs.* 52.5 ± 19.1 at follow-up; $P < 0.05$), indicating reduced self-reported fatigue for 18.1% in patients suffering from MS. This was accompanied by improved SF-36 scores for 14.5% at 4-month follow up. **CONCLUSION:** Supplemental carnosine is effective in reducing fatigue in mid-age patients with MS.

Background

Multiple sclerosis (MS) is a prevalent inflammatory-demyelinating disease, with fatigue and impaired quality of life often reported among key MS pathognomonics. Supplemental *L*-carnosine (dipeptide composed of beta-alanine and *L*-histidine) could be effective in reducing fatigue and improving quality of life in MS patients due to its antioxidative, anti-carbonylating, anti-glycation, neuroprotective and chelating properties yet no human trial evaluated this hypothesis.

Methods

In this open-label interventional preliminary study, 51 MS patients aged 20 to 65 years received oral *L*-carnosine formulation (500 mg per day b.i.d.) during 4 months; most of the patients (83.0%) had relapsing-remitting MS. At baseline and at each month follow-up visits, patients completed two questionnaires: (1) Multidimensional Fatigue Inventory (MFI), a 20-item self-report instrument designed to measure fatigue; and (2) Short Form Survey Instrument (SF-36), patient-reported survey of patient health.

Results

Compliance with the intervention (determined by capsule counts at final visit) was high (88.0 ± 11,4%). Total MFI score improved from 52.5 ± 19.1 at baseline to 64.1 ± 19.1 at 4-month follow-up ($P < 0.05$) (Figure 1). MFI subscales analysis revealed a significant change for cognitive and physical domain after an intervention ($P < 0.05$). This was accompanied by improved SF-36 scores for 14.5% at 4-month follow up (Figure 2).

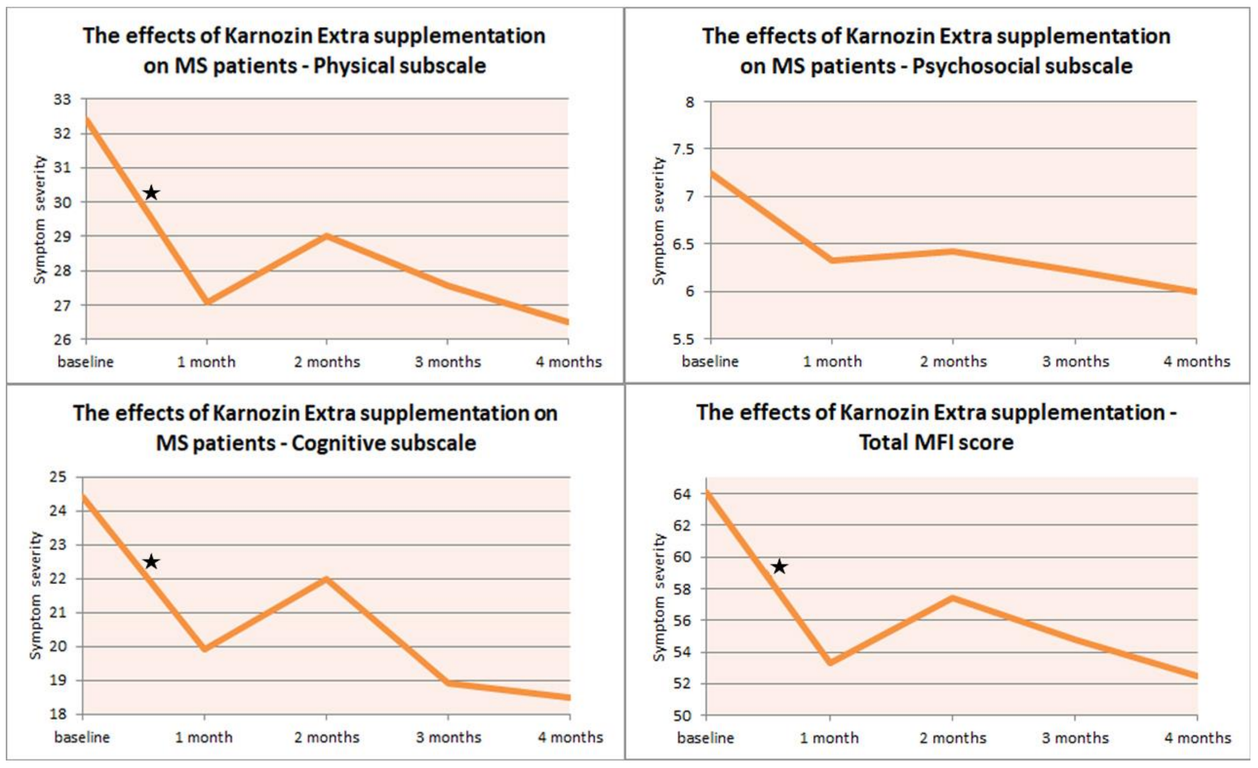

Figure 1. Changes in total MFI score and MFI subscales during the study. Values are mean ± SD.

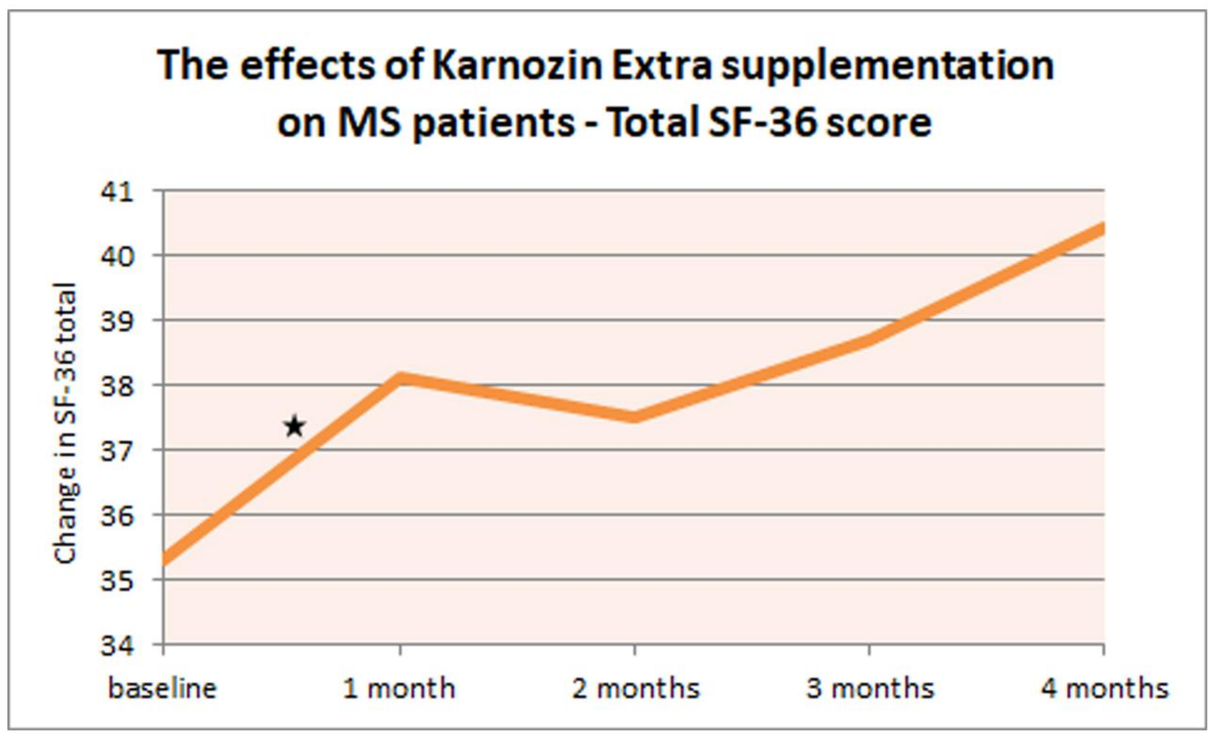

Figure 2. Total SF-36 score at baseline and at each follow-up visit. Values are mean ± SD.

Conclusion

Medium-term supplementation with *L*-carnosine resulted in a significant fatigue reduction and improved health-related quality of life in men and women suffering from MS, while a treatment protocol was well tolerated. Therefore, oral *L*-carnosine may become an important adjuvant to the pharmacological therapeutics available for the management of MS-related fatigue and quality of life. Long-term well-sampled studies are highly warranted to confirm these preliminary results.

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