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Serum Levels of Carnitine in Multiple Sclerosis Patients in Comparison with Healthy People and its Association with Fatigue Severity

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Abstract : Background: Fatigue is a common complaint of multiple sclerosis (MS) patients, adversely affecting their quality of life. There is a lot of evidence showing that Carnitine deficiency is linked to fatigue development and severity in some conditions. This study aimed to compare the levels of Free L-Carnitine (FLC) between MS patients and healthy people and evaluate its association with the severity of fatigue. Methods: This case-control study included 30 patients with relapsing-remitting MS (RRMS) in 2 sex-matched equal-number groups according to the presence or absence of fatigue and 30 sex-matched healthy people in the control group. In addition, between two patient groups, we compared Serum level of FLC between the patient and healthy group. Fatigue was scored using two valid questionnaires of fatigue Severity Scale (FSS) and Modified Fatigue Impact Scale (MFIS). In addition, association between Serum level of FLC and fatigue severity was evaluated in MS patients. Results: There was no significant difference in serum levels of FLC between MS patients and healthy people. The patients with fatigue had a significantly lower FLC (mg/dl) value than patients without fatigue (22.53 ± 15.84 vs. 75.36 ± 51.98, $P < 0.001$). The mean value of FSS and MFIS in patients with fatigue were 48.80±8.55 and 62.87 ± 13.63, respectively, which was nearly two-fold higher than group without fatigue ($P < 0.001$). There was a negative correlation between the serum level of FLC and fatigue severity scales (Spearman rank correlation= 0.76, $P < 0.001$). Conclusion: We showed healthy people and MS patients were not different in levels of FLC. In addition, patients with lower serum levels of FLC might experience more severe fatigue. Therefore, this could clarify that supplementation with L-Carnitine might be considered as a complementary treatment for MS-related fatigue.

Keywords : fatigue, multiple sclerosis, L-carnitine, modified fatigue impact scale
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