

P102

Effect of Vitamin D Replacement On Cognition in Multiple Sclerosis (MS) Patients

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Objective: Background: Multiple Sclerosis (MS) is a chronic inflammatory disease of the central nervous system that is linked to genetic and environmental such as vitamin D status. Vitamin D is associated with cognitive performance. This is a prospective study to evaluate the effect of vitamin D supplementation in MS patients with Vitamin D deficiency (serum level 35 µg/ml) on cognitive function.

Design & Method: Eighty-eight patients diagnosed with relapsing remitting MS or clinically isolated syndrome, aged 18 years and older treated with interferon-beta and without signs of active inflammation or cognitive impairment were recruited. Demographic and health behavior information was collected, patients were screened for depression and anxiety using the Arabic- Hopkins Symptoms Checklist (HSCL-25), cognitive performance was measured using the Arabic-Montreal Cognitive Assessment (MoCA) and Stroop Test, Symbol digit Modalities Test (SDMT) and the Brief Visual Memory Test – Revised (BVMT-R). Blood was collected to examine their vitamin D, and calcium. Subjects were evaluated at baseline and 3 months after vitamin D supplementation (10,000 IU daily for 3 months or 50,000 IU weekly for 3 months).

Results: 46.5 % of the patients had vitamin D deficiency. There was a significant difference between the vitamin D groups on BVMT-DR at baseline and at 3 months ($p < 0.04$). SDMT differed between the groups at baseline ($p = 0.07$). Multivariate analysis revealed age as a predictor of cognitive performance on all tests at baseline and at 3 months. More years of education predicted better cognitive performance on the Stroop (beta 12.1, $p < 0.001$) and BVMT-T1 (beta 2.02, $p < 0.004$) at baseline, and the SDMT (beta 14.54, $p < 0.001$) and MoCA (beta 3.90, $p < 0.0001$) at 3 months. Alcohol intake predicted a better cognitive score on the SDMT (beta 6.16, $p < 0.03$) at baseline and at 3 months (beta 7.92, $p < 0.04$) and BVMT-T1 at 3 months (beta 1.83, $p < 0.03$).

Conclusion: These results show a significant proportion of subjects with vitamin D deficiency and cognitive impairment. The significant correlations between the cognitive tests and vitamin D level provide early positive association between vitamin D level and cognitive performance in MS. Of interest is the positive association of alcohol and cognitive performance on some of the tests that requires further study.