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Vitamin D supplementation effect on DNA repair genes expression in multiple-sclerosis patients

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Multiple Sclerosis is an autoimmune disease of the central nervous system that is followed by inflammation, demyelination, axonal damage and loss in white matter lesions. It is estimated that nearly 2.5 million people affected by MS worldwide. Since young adults are the major target group of this disease, so it is one of the main concerns for public health. Scientific results showed that the epidemiology of MS is quickly changing all over of the world and also studies in Middle East countries have demonstrated that MS prevalence is on the rise for Persian Gulf countries, a moderate-to-high prevalence with an increase in recent years. Iran has a moderate to high MS prevalence rate, with a recent sharp increase in this rate. Genetic and environmental factors are effective in progression of disease process. Studies showed that the high prevalence of MS in the Middle East might be pointed effects of low vitamin D, daily life, smoking, Epstein-Barr virus infection, a history of depression and differentiated genetic backgrounds. Also reports confirmed, oxidative stress plays an important role in the early stages of MS. ROS contribute to several mechanisms underlying the pathogenesis of multiple sclerosis (MS) lesions. Inverse relationship between vitamin D and MS implicated this idea that improvement in EDSS in patients may attenuate oxidative stress through changes in DNA repair gene expression that is associated with oxidative DNA damage. To test this hypothesis peripheral blood samples were collected from 15 RR-MS patients. Plasma samples were measured for 25(OH)D concentration by ELISA kits. RNA from PBMC was isolated. cDNA synthesis is carried out. This step is done before and 2 months after vitamin D therapy for all samples. Quantitative real time PCR was performed for level expression of the NUDT1 and MUTYH genes. Data were normalized to the internal control GAPDH and analyzed using □□Ct method. This pilot study showed that MUTYH and NUDT1 expression was changed in PBMC of patients that treated with vitamin D. Also, a significant relationship was observed between vitamin D level and EDSS in MS patients. The positive effect of vitamin D, on DNA repair system performance to eliminate the oxidative DNA damage could be reason for the ability of this vitamin in reducing the incidence and prevalence autoimmune diseases such as MS. In conclusion, considering the Vitamin D deficiency in Middle Eastern women and positive impact of vitamin in autoimmune disease, it has been suggested that to be considered this supplementation in clinical recommendations and health care.

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