

## CO-EXISTENCE OF DEPRESSION, LOW BONE MINERAL DENSITY, AND VITAMIN D DEFICIENCY IN PATIENTS WITH MULTIPLE SCLEROSIS

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### Dear editor,

Mood disorders are estimated to occur approximately 2-3-times more frequently in patients with multiple sclerosis (MS) than in general population (Patten et al. 2007). Other conditions that occur more commonly in MS patients consist of low bone mineral density (BMD) and higher prevalence of osteopenia or osteoporosis (Sioka et al. 2011). In addition, MS patients exhibited some alterations in body composition compared to control individuals, consisted of reduced remaining substances (L%) and increased amount of fat (F%) in the legs of female patients possibly predisposing to higher risk of osteoporosis in the legs (Sioka et al. 2011).

Patients with depression frequently exhibit low BMD raising the possibility that depression might represent a risk factor for osteoporosis. In addition, vitamin D insufficiency or deficiency may often be present in patients with depression, unclear if it represents a risk factor for depression or it is a secondary event to depression (Anglin et al. 2013).

In the present preliminary study we investigated the presence of depression in 24 adult MS patients (8 males and 16 females), and compared their psychological status with VitD levels, BMD, type of MS, Expanded Disability Status Scale (EDSS), and years of disease. For evaluation of depression, we used the Hamilton Depression Rating Scale. VitD levels were calculated by radioimmunoassay according to manufacture principles of methods (DIAsource 25OH Vitamin D total -RIA-CT Kit/Manufactured by:DIAsource ImmunoAssays

S.A.). When VitD < 10 ng/ml patients were considered as having deficiency, 10 to 29 ng/ml as insufficiency, and 30 to 100 ng/ml as within normal range. BMD was measured in lumbar spine and hip with X-ray absorptiometry scans.

The results of our study demonstrated that among the 24 MS patients, depression was found in 83%, of whom 65% with mild, and 35% with moderate up to severe depression. All tested parameters among patients with depression were compared with those of the patients without depression. Our findings showed that MS patients with depression exhibited lower BMD and VitD levels, especially these with moderate to severe depression. Thus, among the MS patients without depression, 50% had low BMD, 75% low VitD, mean EDSS of 3.5, and mean years of disease 7.25 years. Among the MS patients with mild depression, 75% and 85% exhibited low BMD and VitD respectively, mean EDSS of and 9.2, and 3.2 mean years of diagnosed disease. Finally, in MS patients with moderate to severe depression, 100% had low BMD and 86% low VitD levels. The mean EDSS as well as years of disease were 4.6 and 13.1 respectively.

Due to the small number of patients no advanced statistical analysis could be performed. However, our data suggested that depression, low BMD, and low VitD levels are all associated with MS. In addition, MS patients with depression may have even lower BMD and VitD levels. The severity of the depression is also linked to worse EDSS and longer duration of disease. Psychological evaluation as well as BMD and VitD determination of MS patients may be considered as routine tests to diagnose and treat early these conditions. Larger controlled studies are needed to verify these findings.

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