(S100) MODERATE PHYSICAL ACTIVITY IS ASSOCIATED WITH INCREASED BONE DENSITY IN MULTIPLE SCLEROSIS
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Background: People with multiple sclerosis (MS), including men and premenopausal women, have an increased risk of reduced bone mineral density (BMD) and fractures. Interestingly, glucocorticoid use in MS does not appear to consistently result in reduced BMD. There is evidence that low vitamin D (Vit D, (25[OH]D)) and the suggestion that reduced physical activity (PA) negatively affect BMD in MS. Depression, decreased heart rate variability (HRv), and elevated cortisol are known to be associated with decreased BMD and are also common in people with MS. Objectives: The aim of this study was to determine associations of Vit D, PA, cortisol, depression, and HRv with BMD in people with MS. Methods: We tested 18 people with MS (13 female, 5 male; median Expanded Disability Status Scale [EDSS] score, 2) and 22 control (C) subjects (16 female, 6 male). Depression (Beck) and the Multiple Sclerosis Functional Composite (MSFC) scores were obtained from all. BMD of the lumbar spine (L2-L4) and femoral neck (mean left and right) was measured with dual-energy X-ray absorptiometry (DEXA). Vit D was measured from serum, and cortisol from a salivary sample (11:00 p.m., enzyme immunoassay). HRv was analyzed as the SD of the RR interval, and low-frequency/high-frequency (LF/HF) ratio was obtained from a 10-min supine rest electroencephalogram. Physical activity was measured with accelerometers worn for 7 days around the waist and recorded as raw units. Physical activity was characterized as sedentary, light, moderate (mod), hard, and very hard by accepted cutoffs. Analysis was by unpaired t tests and Pearson correlations. Data are mean (SE). The statistical significance level was P ≤ .05. Results: MS subjects compared with C subjects reported greater depression (MS, 11[2]; C, 3[1]; P = .001) and had lower MSFC scores (MS, 1.9 [0.2]; C, 2.8 [0.1]; P < .001). There were no differences between groups in BMD, Vit D, cortisol, or measures of HRv. Among PA, mod PA differed between groups (MS, 16[3] units; C, 32[5]; P = .015) and was correlated to femoral BMD in the MS group (r = 0.53, P = .02) but not the C group (r = −0.16, P = .50). EDSS score was also correlated to femoral BMD (r = −0.50, P = .04). No relationship was observed between mod PA or EDSS and L2-L4 in the MS or C group. Neither Vit D, cortisol, depression, nor HRv was correlated to BMD in the MS or C group. Conclusions: In people with MS replete with Vit D, mod PA but not cortisol, depression, or HRv may contribute to BMD.

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