Relationship between Vitamin D Levels and Disease Activity in Patients with Systemic Sclerosis

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Background/Purpose: Low Vitamin D (VD) levels have been observed in several autoimmune diseases, including systemic sclerosis (SSc). Some studies have shown the importance of VD in SSc, but its significance has not yet been determined. We aim to evaluate differences in serum levels of VD in SSc patients compared to a control group, and to correlate such levels with disease activity, clinical and laboratory features.

Methods: We included patients diagnosed with SSc according to ACR 1980 criteria and subtypes according to Le Roy, who consecutively attended the Rheumatology Service in spring and summer during 2 years. Patients with overlapping syndromes, diseases or drugs that interfered with VD serum level 6 months prior to study entry were excluded. A control group of 58 blood donors without autoimmune disease and negative autoantibodies was matched by sex and age. Determination of $25(OH)D_3$ was performed through radioimmunoassay-chemiluminescence assay. Levels between 20 and 29.9ng/ml were classified as VD insufficiency while concentrations lower than 20ng/ml as deficiency. For the SSc group, demographic and clinical data were collected, and mRSS (modified Rodnan Skin Score), scleroderma health assessment questionnaire (S-HAQ), EUSTAR Disease Activity Score and Medsger Severity Score were performed. Statistical Analysis: Numerical variables were compared by Student's t test or Mann-Whitney test and categorical variables by x^2 test. A value of $p<0.05$ was considered significant.

Results: The SSc group included 58 patients; median age of 57 years. The mean value of VD was 19.9±8.7ng/ml in the SSc group, and 29.6±8.6ng/ml in the control group ($P<0.001$). A total of 29 patients (50%) in the SSc group had deficiency, 20 (34.5%) had insufficiency and 9 (15.5%) presented normal levels. In the control group, 6 (10.3%) presented deficiency, 27 (46.6%) insufficiency and 25 (43.1%) normal VD levels. SSc group patients presented a statistically significant higher frequency of deficiency ($p\leq0.001$) but not of insufficiency ($p=0.607$). Out of the 22 patients (38%) with diffuse SSc, 17 (77%) presented deficiency, 4 (18%) insufficiency and 1 (5%) normal VD levels. Among the 36 patients (62%) with limited disease, 12 (33%) had deficiency, 16 (44%) insufficiency and 8 (23%) normal levels. The group of diffuse SSc presented a significantly higher frequency of hypovitaminosis D (VD<30ng/ml)($p=0.005$). Patients with suboptimal levels showed higher Rodnan Score, S-HAQ, EUSTAR Disease Activity Score (all with $p\leq0.001$) and Medsger Score ($p=0.002$) and late SD pattern ($p=0.049$). All presented normal calcemia, calciuria and parathormone. A subgroup of 16 patients (28%) received low doses of steroids (prednisone or equivalent ≤10mg/d) with no significant difference in VD level compared to those who did not receive it.

Conclusion: Hypovitaminosis D was found in more than 80% of SSc patients with a significant difference compared to healthy controls. They presented more frequently the diffuse form, higher cutaneous involvement, more severe and active disease and higher levels of disability.