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Original article

Low vitamin D serum levels in diffuse systemic sclerosis: a correlation with worst quality of life and severe capillaroscopic findings

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ARTICLE INFO

Article history:

Received 6 August 2015

Accepted 11 March 2016

Available online 2 June 2016

Keywords:

Systemic sclerosis

Vitamin D

Quality of life

Nailfold capillaroscopy

ABSTRACT

Objective: The aim of this study was to analyze the correlation of vitamin D levels with clinical parameters, bone mineral density (BMD), quality of life (QoL) and nailfold capillaroscopy (NC) in patients with diffuse systemic sclerosis (SSc).

Methods: Thirty-eight female patients with diffuse SSc were analyzed regarding 25-hydroxyvitamin D (25OHD) serum levels. At inclusion, organ involvement, autoantibodies, modified Rodnan skin score (mRSS), Medsger Disease Severity Index (MDSI), body mass index (BMI), BMD, NC, Short-Form-36 Questionnaire (SF-36), and Health Assessment Questionnaire (HAQ), were performed through a standardized interview, physical examination and electronic chart review.

Results: Mean 25OHD serum level was 20.66 ± 8.20 ng/mL. Eleven percent of the patients had 25OHD levels ≤ 10 ng/mL, 50% ≤ 20 ng/mL and 87% ≤ 30 ng/mL. Vitamin D serum levels were positively correlated with BMI ($r = 0.338$, $p = 0.038$), BMD-total femur ($r = 0.340$, $p = 0.037$), BMD-femoral neck ($r = 0.384$, $p = 0.017$), SF-36-Vitality ($r = 0.385$, $p = 0.017$), SF-36-Social Function ($r = 0.320$, $p = 0.050$), SF-36-Emotional Role ($r = 0.321$, $p = 0.049$) and SF-36-Mental Health ($r = 0.531$, $p = 0.0006$) and were negatively correlated with HAQ-Reach ($r = -0.328$, $p = 0.044$) and HAQ-Grip Strength ($r = -0.331$, $p = 0.042$). A negative correlation with NC-diffuse devascularization ($p = 0.029$) and NC-avascular area ($p = 0.033$) was also observed.

Conclusion: The present study provides novel evidence demonstrating that low levels of 25OHD have a negative impact in diffuse SSc QoL and further studies are needed to define whether vitamin D supplementation can improve health related QoL in these patients. The additional observation of a correlation with severe NC alterations suggests a possible role of 25OHD in the underlying SSc vascular involvement.

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<http://dx.doi.org/10.1016/j.rbre.2016.05.006>

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Baixos níveis séricos de vitamina D na esclerose sistêmica difusa: correlação com pior qualidade de vida e alterações capilarescópicas graves

R E S U M O

Palavras-chave:

Esclerose sistêmica
Vitamina D
Qualidade de vida
Capilaroscopia periungueal

Objetivo: O objetivo deste estudo foi analisar a correlação entre os níveis de vitamina D e parâmetros clínicos, densidade mineral óssea (DMO), qualidade de vida (QV) e capilaroscopia periungueal (CPU) em pacientes com esclerose sistêmica difusa (ES).

Métodos: Mensuraram-se os níveis séricos de 25-hidroxivitamina D (25OHD) de 38 pacientes do sexo feminino com ES difusa. No momento da inclusão, analisaram-se o envolvimento de órgãos, autoanticorpos, escore cutâneo de Rodnan modificado (ERM), Medsger Disease Severity Index (MDSI), índice de massa corporal (IMC), DMO, CPU, Short-Form-36 Questionnaire (SF-36) e Health Assessment Questionnaire (HAQ) por meio de uma entrevista padronizada, exame físico e avaliação de prontuário eletrônico.

Resultados: A média do nível sérico de 25OHD foi de $20,66 \pm 8,20$ ng/mL. Dos pacientes, 11% tinham níveis de 25OHD ≤ 10 ng/mL, 50% ≤ 20 ng/mL e 87% ≤ 30 ng/mL. Os níveis séricos de vitamina D estiveram positivamente correlacionados com o IMC ($r=0,338$, $p=0,038$), DMO-fêmur total ($r=0,340$, $p=0,037$), DMO-colo femoral ($r=0,384$, $p=0,017$), SF-36-Vitalidade ($r=0,385$, $p=0,017$), SF-36-Aspecto social ($r=0,320$, $p=0,050$), SF-36-Aspecto emocional ($r=0,321$, $p=0,049$) e SF-36-Saúde mental ($r=0,531$, $p=0,0006$) e se correlacionaram negativamente com o HAQ-Alcance ($r=-0,328$, $p=0,044$) e HAQ-força de preensão ($r=-0,331$, $p=0,042$). Também foi observada uma correlação negativa com a CPU-desvascularização difusa ($p=0,029$) e CPU-área avascular ($p=0,033$).

Conclusão: O presente estudo fornece evidências novas de que níveis baixos de 25OHD têm um impacto negativo sobre a qualidade de vida de pacientes com ES difusa e que são necessários mais estudos para definir se a suplementação de vitamina D pode melhorar a qualidade de vida relacionada com a saúde desses pacientes. A observação adicional de uma correlação com alterações graves na CPU sugere um possível papel da 25OHD no envolvimento vascular subjacente da ES.

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Significance & innovations

- 1) Low vitamin D serum levels had a negative impact on physical and emotional domains of quality of life in diffuse SSc patients.
- 2) Low vitamin D serum levels were correlated with severe capillaroscopic findings.
- 3) Lower vitamin D levels were more frequently observed in patients with anti-Scl 70 positive.

Introduction

In the last two decades, the survival of patients with systemic sclerosis (SSc) has significantly improved.^{1,2} Nevertheless, SSc can still cause increased disability and reduced quality of life. Several factors can be involved with these conditions, as disease subtype,³ gender,⁴ lung involvement,³ pruritus,⁵ fatigue,⁶ anxiety and depression.^{7,8} Hand, tendon and joint involvement are other factors which can cause significant functional disability, leading to consequent disuse and worsening of bone loss in patients with SSc,^{9,10} contributing to a significant impairment in the quality of life of these patients.¹⁰

Low levels of 25-hydroxyvitamin D (25OHD) may also contribute to the chronic inflammation, immunological dysregulation and skeletal myopathy with a consequent reduction in quality of life in autoimmune diseases.^{11,12} Studies evaluating vitamin D levels in SSc patients revealed a high frequency of this condition and a possible association with inflammation and pulmonary hypertension.¹³⁻¹⁸ There are, however, no data regarding low vitamin D impact in quality of life in these patients.

The aim of this study was therefore, to analyze the correlation of vitamin D with quality of life, clinical parameters and nailfold capillaroscopy (NC) in patients with diffuse SSc.

Methods

Patients

This is a cross-sectional study analyzing 38 diffuse SSc patients who attended the Scleroderma Outpatient Clinic of the University of São Paulo from May 2012 to May 2013. All patients were classified as SSc according to the recent EULAR/ACR criteria.¹⁹ Inclusion criteria were female gender; age between 18 and 50 years; diffuse SSc according to LeRoy et al. criteria²⁰; capacity to understand the study and sign

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