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Review article

Effect of vitamin D supplementation on patients with systemic lupus erythematosus: a systematic review



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ABSTRACT

The objective of this systematic review was to analyze clinical trials carried out for the investigation of the effect of vitamin D supplementation on systemic lupus erythematosus. The research was performed from August to September 2016, without limits regarding year of publication, restriction of gender, age, and ethnicity. For the guiding question, the PICO strategy was employed. To evaluate the quality of the publications the PRISMA protocol and Jadad scale were used. The risk of bias analysis of the clinical trials was performed using the Cochrane collaboration tool. After the process of article selection and removal of duplicates, four articles were identified as eligible. The results of three studies showed a positive effect of supplementation on disease activity reduction and significant improvement in levels of inflammatory markers, fatigue, and endothelial function. Only one study showed no improvement in disease activity after supplementation. Moreover, all studies showed an increase in serum vitamin D levels. The data from this review provide evidence on the benefits of vitamin D supplementation in patients with lupus and vitamin D insufficiency/deficiency. However, it is still necessary to elucidate whether vitamin D acts in the protection against this metabolic disorder, as well as the standardization of the type, dose and time of vitamin D supplementation.

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Efeito da suplementação com vitamina D em pacientes com lúpus eritematoso sistêmico: uma revisão sistemática

R E S U M O

Palavras-chave:

Vitamina D
Lúpus eritematoso sistêmico
Suplementação
Revisão sistemática

O objetivo desta revisão sistemática foi analisar ensaios clínicos realizados na investigação do efeito da suplementação com vitamina D sobre o lúpus eritematoso sistêmico. A pesquisa foi realizada nas bases de dados Scopus, PubMed e Biblioteca Cochrane, no período de agosto a setembro de 2016, sem limite de ano de publicação, restrição de gênero, idade e etnicidade. Para a questão norteadora foi empregada a estratégia PICO. Para avaliar a qualidade das publicações utilizou-se o protocolo PRISMA e a escala de Jadad. A análise do risco de viés dos ensaios clínicos ocorreu pela ferramenta de colaboração Cochrane. Após o processo de seleção e remoção de artigos duplicados, quatro artigos foram identificados como elegíveis. Os resultados de três estudos mostraram efeito positivo da suplementação na redução da atividade da doença e melhora significativa nos níveis de marcadores inflamatórios, fadiga e função endotelial. Em apenas um estudo não houve melhora na atividade da doença após a suplementação. Ademais, todos os estudos apresentaram aumento dos níveis séricos de vitamina D. Os dados dessa revisão fornecem evidências dos benefícios da suplementação com vitamina D sobre o lúpus em pacientes com insuficiência/deficiência. Contudo, ainda é necessário elucidar a atuação do nutriente na proteção contra esse distúrbio metabólico, bem como a padronização do tipo, dose e tempo de suplementação com vitamina D.

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Introduction

Systemic lupus erythematosus (SLE) is a chronic, autoimmune inflammatory disease that affects several organs and systems of the body. Its cause and epidemiology are unknown, since a combination of factors, including ethnicity, gender, genetic and environmental aspects are involved. The disease affects 30–50/10,000 individuals worldwide, most frequently affecting young women of reproductive age, affecting 10–12 women for each man.^{1,2}

Recent studies have highlighted the role of vitamin D in the development of autoimmune diseases. Vitamin D deficiency seems to be associated with SLE activity, partly due to dysregulation in cytokine production balance. The photosensitivity and recommendation of sunscreen use, as well as other measures for less sun exposure, may favor the reduction of cutaneous vitamin D synthesis.³

Therefore, due to the importance of the vitamin D-SLE binomial, the aim of this review was to evaluate the effects of vitamin D supplementation on systemic lupus erythematosus, contributing to the increase of knowledge based on scientific evidence, considering that the subject is relevant, new and, therefore, requires more discussion to adequately guide the decision-making by health professionals.

Methods

A Systematic Review (SR) of studies on vitamin D supplementation in patients with Systemic Lupus Erythematosus was performed. The PICO strategy was used to establish the guiding question of the present study, which represents the acronym for problem or population (P), intervention (I), comparison (C) and outcome (O). These four components are

the fundamental elements of the research question and of the question construction for the bibliographic search for evidence.⁴ This strategy culminated in the definition of the following guiding question: Does vitamin D supplementation lead to clinical improvement in SLE patients? Each PICO domain corresponded to the following elements: (P) Patients with systemic lupus erythematosus, (I) Vitamin D supplementation, (C) Placebo and (O) clinical improvement of SLE patients.

The search was carried out in the Scopus, PubMed, and Cochrane Library databases for published clinical trials with no limit regarding year of publication, and no restriction regarding gender, age, and ethnicity, all published in the English language. The Boolean connector “and” was used in the combination of the Medical Subject Heading (MeSH) terms: systemic lupus erythematosus and clinical trial, vitamin D and supplementation and vitamin D and supplementation and clinical trial.

The titles and abstracts of the selected articles were analyzed to verify whether they met the inclusion criteria: having a controlled clinical trial design and being available as a full-text article. The evaluation of the eligibility criteria was performed independently by the two authors, and in case of divergence, a third researcher was consulted.

To ensure the SR quality, the Preferred Reporting Items for Systematic Reviews, and Meta-Analyses (PRISMA) protocol was used.⁵ The Jadad scale⁶ was used independently by two blinded researchers for the qualitative classification. Scores were assigned to the studies (from zero to five), based on the criteria: randomization method (sequences and randomization criteria of participants), blinding (for patients and researchers) and description of follow-up loss proportion. The risk of bias in the clinical trials included in this study was identified through the Cochrane Collaboration Tool.⁷

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