



Pro-Inflammation of Vitamin Deficiency in Systemic Lupus Erythematosus Disease

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DESCRIPTION

Systemic Lupus Erythematosus (SLE) is a complex autoimmune disease that affects multiple organs and systems. It is characterized by the production of autoantibodies that target various self-antigens, leading to inflammation and tissue damage. The causes of SLE are not fully understood, but genetic, environmental and hormonal factors are involved. Vitamin D is a fat-soluble vitamin that has multiple functions in the body. It is mainly synthesized in the skin by exposure to Ultraviolet (UV) rays from the sun, but it can also be obtained from dietary sources or supplements. Vitamin D acts as a hormone that regulates calcium and phosphorus metabolism, bone health, immune system function and cell growth and differentiation.

Many studies have shown that there is a link between vitamin D and SLE. People who have SLE are more likely to have low levels of vitamin D. In addition, disease severity has been linked to low vitamin D levels. This may be because people with SLE are sensitive to the sun, so they often either wear high SPF sunscreen or avoid being outdoors. Moreover, some medications used to treat SLE, such as corticosteroids and antimalarials, can interfere with vitamin D metabolism or absorption. The physiologic and clinical consequences of vitamin D deficiency in SLE are not entirely known. However, some possible mechanisms have been proposed. Vitamin D deficiency may impair the regulation of the immune system, leading to increased autoimmunity and inflammation. Vitamin D deficiency may also affect the expression of genes involved in SLE pathogenesis, such as those encoding cytokines, chemokines and toll-like receptors. Furthermore, vitamin D deficiency may increase the risk of osteoporosis, cardiovascular disease and infections, which are common complications of SLE.

The optimal level of vitamin D for SLE patients is not clearly established. However, some experts recommend maintaining a serum 25-hydroxyvitamin D level (the index for measuring vitamin D level) above 30 ng/ml. This can be achieved by increasing sun exposure (with appropriate sun protection),

consuming foods rich in vitamin D (such as fatty fish, egg yolks and fortified dairy products) or taking vitamin D supplements (with or without calcium). The dose and duration of vitamin D supplementation should be individualized according to the patient's baseline level, response and tolerance. However, the optimal dose and duration of vitamin D supplementation for SLE patients are not clear and need more research. SLE patients should have their vitamin D levels checked regularly and receive individualized treatment based on their clinical condition and risk factors.

Increased peripheral insulin resistance, decreased renin activity, altered vascular endothelial functions, diminished immunomodulating effects of cytokines and hormones like Interleukin-10 (IL-10), Tumor Necrosis Factor (TNF), and Parathyroid Hormone (PTH), and increased coronary artery calcification are some of the negative effects of vitamin D deficiency on the cardiovascular system. Patients with SLE are at risk of atherosclerosis due to the increased prevalence of the classic risk factors such hypertension, diabetes mellitus, and chronic elevation of atherogenic cytokines. Patients with stage 3 and stage 4 chronic renal diseases demonstrated that paricalcitol (a vitamin D molecule) treatment resulted in a 3.2 times larger decrease in proteinuria than placebo.

CONCLUSION

The benefits of vitamin D supplementation in SLE patients are still under investigation. Some studies have suggested that vitamin D supplementation may improve disease activity, reduce flares, decrease autoantibody production, modulate immune responses and enhance quality of life. However, other studies have not found significant effects or have reported adverse events such as hypercalcemia or kidney stones. Therefore, more randomized controlled trials are needed to confirm the efficacy and safety of vitamin D supplementation in SLE patients. It is common and may be associated with worse outcomes in SLE patients. Vitamin D supplementation may have potential benefits in modulating disease activity and preventing

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complications. However, more research is needed to determine the optimal level, dose and duration of vitamin D supplementation for SLE patients.