Vitamin D supplements may benefit lupus patients

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A new clinical study published in BioMedCentral's open access journal *Arthritis Research and Therapy* provides preliminary evidence that vitamin D supplementation could be considered an immunomodulatory agent for systemic lupus erythematosus (SLE), a debilitating autoimmune disease characterized not only by skin, joint, neurological and renal symptoms, but also by inflammation of tissue linings in the body.

SLE is a T- and B-cell-dependent disease that causes an appearance of autoantibodies, causing the body to attack itself. Patients present with a depletion of regulatory T cells (Tregs) that normally protect against autoimmune disease, an increase in cytokine-producing T helper (Th) 17 cells and an increase in IFN-inducible genes, which trigger the body's protective responses. Recent studies have shown that vitamin D could ameliorate these effects.

In a prospective clinical trial, Nathalie Costedoat-Chalumeau and colleagues set out to evaluate the safety and immunological effects of vitamin D supplementation in 20 SLE patients with low vitamin D levels. They observed these patients over six months and found that vitamin D was not only well-tolerated but, more importantly, there were no SLE flare-ups during the follow-up period.

Vitamin D supplementation in these patients caused an increase in beneficial CD4+ cells (mature Th cells), an increase in Treg cells and a decrease of effector Th1 and Th17 cells. It also induced a decrease of

memory B cell and anti-DNA antibodies – all beneficial for SLE symptoms. The authors found that no modification of existing immunosuppressant drugs was needed, nor any new drugs initiated.

Although preliminary in nature, these findings suggest that vitamin D provides beneficial immunological effects for SLE, with a decrease in B memory cells and effector T cells, and an increase in Tregs. Costedoat-Chalumeau said "This should be confirmed in larger randomized controlled trials."

Costedoat-Chalumeau believes that the findings confirm that vitamin D may also play other roles in the immune system. She said "The study has highlighted interesting pathways to explore. Among the identified signatures, we observed the down-regulation of RNA polymerase functions and histone expression and the up-regulation of the TP53/CDKN1A-related pathway. These deserve further research owing to their possible involvement with a decrease in the accumulation of autoantigens and the activation and proliferation of autoreactive T and B lymphocytes."

More information: Restoration of regulatory and effector T cell balance and B cell homeostasis in systemic lupus erythematosus patients through vitamin D supplementation Benjamin Terrier, Nicolas Derian, Yoland Schoindre, Wahiba Chaara, Guillaume Geri, Noel Zahr, Kuberaka Mariampillai, Michelle Rosenzwajg, Wassila Carpentier, Lucile Musset, Jean-Charles Piette, Adrien Six, David Klatzmann, David Saadoun, Patrice Cacoub and Nathalie Costedoat-Chalumeau, *Arthritis Research and Therapy* (in press).

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