

The effect of vitamin D deficiency on Inflammatory disorders

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Madam, Cholecalciferol (Vitamin D3) 25-hydroxyvitamin D, more commonly known as Vitamin D (VD), is the generalized name given to Vitamin D2 (ergocalciferol) and Vitamin D3 (cholecalciferol), which regulate a wide variety of homeostatic functions in the body. It is a secosteroid, and is mainly produced in the skin when 7-dehydrocholesterol interacts with ultraviolet radiation from the sun¹. Its main function within the body has been believed to be stimulating calcium and phosphorus absorption in the intestine, promoting bone homeostasis through the regulation of osteoblast differentiation, and matrix calcification². A recent study by Arshad et al. has revealed that over 50% of the general population of Pakistan, regardless of age and gender, suffer from a VD deficiency despite the appreciable levels of sunshine in the country³. Although poor nutrition is the leading cause of many vitamin deficiencies prevalent throughout Pakistan, the low levels of VD in the population pose the most harmful long-term effects if left untreated. A study has solidified the belief that a deficiency of this vitamin can lead to various inflammatory disorders such as Multiple Sclerosis, Systemic Lupus Erythematosus, and Rheumatoid Arthritis (RA)⁴. RA, in particular, is caused by an elevation in the concentration of inflammatory cytokines, (TNF- α , IL-6, and IL-1), in the blood, which increase the aromatase activity in monocyte-derived macrophages. This upregulates estrogens in the synovial fluid, supporting the proliferative state of the synovial cell. VD works to

decrease the expression of aromatase in human macrophages, therefore, inhibiting local inflammation. Many patients suffering from this deficiency are asymptomatic. The reason for a decrease in their quality of life often goes undiagnosed, primarily due to poverty prevalent in the country, coupled with the costs of receiving basic healthcare facilities. Along with this, a lack of awareness and limited sun exposure, particularly in urban areas, is the main reason for widespread VD deficiency in the region. The use of supplements containing cholecalciferol, exercise, and strict fortification of staple foods with VD is necessary to overcome this problem⁵.

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