

Vitamin D deficiency A concerning pandemic

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Vitamin D deficiency is a particularly important public health issue because it is an independent risk factor for total mortality in the general population.¹ A review in this issue of *journal* highlights the role of vitamin D supplementation in preventive care for type-2 diabetes.² It summarizes the various aspects of vitamin D in diabetes. It has significant role in fractures, autoimmune diseases and depression.¹ Vitamin D deficiency affects almost 50% of the world's population³ and approximately 84.7% of people in Pakistan are vitamin D deficient.⁴ It is a pandemic that can be associated to lifestyle and environmental factors that reduce exposure to sunlight. The major source of Vitamin D is exposure to natural sunlight and ultraviolet light, therefore, a decrease in exposure is the main cause of deficiency in every population. The deficiency is defined as serum 25(OH)D level of less than 0.8 IU as recommended by the Institute of Medicine (IOM) guidelines.^{3,5,6}

An explanation of the higher deficiency rates in Pakistan can be attributed to the fact that a darker skin tone absorbs more UV light in the melanin of their skin than people with a lighter skin tone; this means that more sun exposure is required to produce the same amount of vitamin D.⁷ Additionally, the use of sunscreen with a sun protection factor of 30 reduces vitamin D synthesis in the skin by more than 95%.⁸

Molecular genetic variation in vitamin D receptor gene may have a role in leading to osteoporosis in post menopausal women, as reported in this issue of *journal*.⁹ Lastly, there is an inverse association of serum 25(OH)D and body mass index (BMI) greater than 30 kg/m.²¹⁰ Due to the cutoff values of BMI being lower for South Asian populations, it can be said that vitamin D deficiency is higher in Pakistan due to a larger proportion of the population being above the lower cut-off values in the region. The function of vitamin D in the body is to assist in the absorption of dietary calcium and phosphorus. If

those of these minerals are deficient in the body, it results in an increase in PTH levels.^{3,11} If the PTH levels are increased, it causes there to be an increased level of osteoclastic activity, this in turn creates local foci of bone weakness which results in decrease in bone mineral density (BMD). If the BMD is reduced sufficiently, it can lead to osteopenia and osteoporosis.³ Apart from the listed conditions, if a young child is vitamin D deficient, it can lead to skeletal deformities, which are known as rickets.¹²

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On the other hand, proper vitamin D levels are associated with many benefits. The first major benefit of appropriate serum vitamin D is its preventive and therapeutic implications in diabetes mellitus.² Furthermore, vitamin D levels in association with hepatitis C have shown that more deficient patients presented with a higher grade of fibrosis, as reported in this issue of *journal*.¹³ They showed that there is significant difference of vitamin D level in in cirrhotic and non cirrhotic patients. These are very beneficial associations in a Pakistani population as diabetes mellitus and hepatitis C are both common problems in our country.

Proper serum vitamin D levels have been associated with lower degree of colorectal cancer,¹⁴ less chances of fractures,¹⁵ reduced changes of autoimmune diseases like multiple sclerosis, and decreased the severity of depressive symptoms in clinical depression.¹⁶ From above discussion, it can be concluded that with the correction of vitamin D levels, it is possible to prevent diabetes mellitus and reduce the morbidity of hepatitis C patients undergoing liver cirrhosis.

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