

Vitamin D deficiency: Should we prescribe supplements to all?

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Vitamin D deficiency has emerged as a global public health problem¹ of immense importance that has potential to positively impact health of population, if corrected on a population level.

It is interesting and indeed intriguing to note, a very high prevalence of Vitamin D deficiency in countries, all across the globe.

It is difficult to comprehend Vitamin D deficiency in over 90% of Pakistani population, despite there being abundance of sunlight throughout the year. It is perhaps even more surprising to note, a high prevalence of Vitamin D deficiency in countries such as Australia² and New Zealand, where there is high prevalence of skin cancer due to sunlight exposure and abundance of diet rich in Vitamin D.

It has been argued, that if 90% population is having Vitamin D deficiency and insufficiency levels in Pakistan³ then perhaps they should be regarded as normal and the remaining 10% should be regarded as above normal. Though there may be some basis for such an argument, one must consider that these levels have been biochemically defined. Insufficient or deficient levels are considered at levels below which, parathyroid hormone starts to rise, signaling start of secondary parathyroidism. Therefore there should not be any doubt

with regards to laboratory values recommended to diagnose Vitamin D deficiency and insufficiency. It is important to consider that with Vitamin D deficiency, replacement with Vitamin D increase absorption of calcium from the gut and therefore calcium requirement is also met.

Adverse consequences of Vitamin D deficiency and insufficiency have been documented in literature^{4,8}. Its deficiency has a role in non-communicable diseases such as diabetes⁴, hypertension⁶, and obesity, even though it has been questioned⁹. Since Vitamin D deficiency suppresses immunity, there is a higher incidence of infections, cancers and autoimmune diseases⁷. Its deficiency has been linked to mental health issues including depression⁹ and psychosis. Pregnant women and their newborn in Pakistan population from urban settings have been found to be severely Vitamin D deficient⁵. The pregnancy related outcomes for mother and fetus are improved, if Vitamin D is corrected during pregnancy. Pregnant mothers, who maintain optimal Vitamin D levels during pregnancy, are less likely to pass on probability of their children developing diabetes, hypertension and other diseases later on in life, through a phenomenon of gene expression called epigenetics.

It has been argued and rightly so, that conversion to Vitamin D is not happening on exposure to sunlight and ultraviolet radiation. One of the explanations put forth, is that the mechanism which helps form Vitamin D in skin has become a malfunction over centuries, from changes in our lifestyle that includes covering our body with clothes and avoidance of exposure to sunlight. If one could get enough Vitamin D from exposure to sunlight, then huge population living in countries with abundant

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sunlight such as Australia and Saudi Arabia, would not be Vitamin D deficient¹⁰.

If one considers dietary sources for Vitamin D, then amount of milk and milk products, fish and egg yolk for example, considered rich sources would expose one to other health risks, if taken in amounts required to provide optimum blood levels of Vitamin D. If dietary sources could rectify Vitamin D deficiency then, high prevalence of Vitamin D deficiency would not be found in countries, where people have access to diet rich in Vitamin D sources such as Australia and Saudi Arabia¹¹.

If one considers that sun exposure and dietary sources are strategies that will not correct Vitamin D deficiency or insufficiency, than one must consider prescribing Vitamin D supplements to everyone and on a regular basis. Since blood test to check Vitamin D levels is expensive, one can consider giving Vitamin D supplements to all patients on empiric basis and without doing blood test, particularly in resource constraint countries. There is a real possibility of Vitamin D toxicity if high doses are used without safety netting.

If up to 200,000 units of Vitamin D are given orally every other month and with instructions that patient should return if they suffer from loss of appetite, nausea, confusion, increased urination which are signs of hypercalcemia, then one can safely maintain optimum Vitamin D blood levels which are over 50 ng/ml. If carefully executed, this strategy can help correct Vitamin D deficiency in the population and ensure positive impact on health and adequate Vitamin D levels.

Vitamin D deficiency is a major global public health problem. Consequences of its deficiency are immense with highly adverse impact on health of population. Options for correcting Vitamin D level at population level are simple and inexpensive with huge potential for improving health of populations

across countries. Community awareness programs must be initiated in order to bring the issue to common peoples' knowledge. We appeal to all stakeholders to help correct Vitamin D deficiency and its adverse consequences on health at population level.

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