



# Vitamin D: Which Way are we Headed?

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## Opinion

The first scientific description of vitamin D-deficiency, namely rickets, was provided in the 17th century by both Dr. Daniel Whistler (1645) and Professor Francis Glisson (1650). In 1919 Mellanby proposed that rickets is due to the absence of a fat-soluble dietary factor and in 1925 McCollum and co-workers named the anti-rachitic factor Vitamin D [1]. For decades vitamin D remained under the domain of pediatricians and orthopaedic surgeons for the treatment of rickets and osteomalacia. In later part of the last century, the management of osteoporosis brought vitamin D in the forefront and since then has occupied the minds of the health care givers, patients and the general population at large. In the last 30 years more 53000 papers world over and 214 from Saudi Arabia are cited in [www.pubmed.gov](http://www.pubmed.gov) [2] related to Vitamin D and search in Google on "Vitamin D" gave 62,400,000 active sites [3].

Reports in the literature suggest that in the world today one billion people from all ethnic and age groups lack adequate levels of Vitamin D. Extensive study from all regions of Saudi Arabia put the deficiency in 1983 between 0 and 30 percent [4], while in 2008 and 2009 [5,6] the figures in eastern province reached about 50%, but recent figures reports of vitamin D deficiency up to 99.03% [7]. Recently reported figures of deficiency are 62.65% of female Saudis and 40.6% of male Saudis aged 15 years and above are deficient in vitamin D [8].

Vitamin D (25-hydroxy vitamin D-25 OHD) levels have been classified as normal ( $\geq 30$ ng/ml), insufficiency between (21 and 29ng/ml) and deficiency  $\leq 20$ ng/ml. On these levels it was reported the world over the deficiency and insufficiency is quite high among various ethnic populations, even though people are not showing signs and symptoms related to very low levels of 25 OHD. Keeping in mind recently Janz & Pearson [9] in Canada conducted a survey and on 25 OHD levels and a level of (12ng/ml)  $< 30$ nmol/L to represent the deficiency level was recommended and at this level only 32% of the population lies in the vitamin D deficiency status. Similarly in United Kingdom in agreement with the Institute of Medicine (IOM), it was adopted that in respect to bone health of Serum 25 OHD (12ng/ml)  $< 30$ nmol/L is to be regarded as deficient [10] This was recommended by more than 12 reputed associations in United Kingdom.

Second issue which need to be addressed is the assays used in testing the levels of 25 OHD. Different labs have different assays which give different results and this confuses the treating physician and the patients alike. There is lack of result comparability between different assays and often even between the same assays performed in different laboratories [11]. Snellman et al. [12] showed that level of 25OHD by HPLC was 85nmol/l and by CLIA it was 55nmol/l. Recently Sadat et al. [13] showed very similar results among Saudi Population of 22ng/ml to 9ng/ml when LCMS/MS was compared with CLIA. This indicated that when assays other than HPLC/ LCMS are used there is a false positive of insufficiency and deficiency.

Lastly, a onetime and single test of 25OHD level cannot be taken as confirmative of deficiency or insufficiency. High levels of Parathyroid hormone (PTH) are definitely associated with low levels of 25 OHD. Hence without corroboration between 25 OHD levels and PTH levels may not be correct. In a recent study among Saudi population it was found that in all patients with vitamin D deficiency assessed by LCMS/MS, PTH level has high [14]. Thus in cases a normal PTH level will indicate a normal Vitamin D level even though CLIA may indicate deficiency or insufficiency of vitamin D.

We believe that time has come where researchers in the field should come to a consensus to bring the level of 25OHD to 12ng/ml or any reasonable level based on the requirement of our population for disease prevention. A standard approach will help in calming down the apprehensions and worries of patients at large, who believe that they have vitamin D deficiency even though they may not. Lastly a concerted effort with formulating and implementing guidelines will help the health care providers in taking appropriate decisions in the good clinical practice and ultimately better health care of the population.

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