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Editorial Open Access

Need to Redefine Population-Specific Reference Values of Vitamin-D

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Editorial

Recently, epidemiology of Vitamin D deficiency has gained much attention among the scientific community. Based on the reference ranges obtained in one country scientists from everywhere especially from those countries of South Asia and Middle East are reporting a mass level Vitamin D deficiency in people who are apparently healthy [1-4]. Studies have reported that people living in Europe or North America are deficient in Vitamin D [5,6]. These findings are very disturbing, considering the fact that main source of Vitamin D is exposure to sunlight and all countries of these regions are generally having abundant sunshine.

One can easily point out the limitation of all these studies, these have followed the reference ranges of Vitamin D calculated on western populations. A valid question can be "Can we label a person as Vitamin D deficient based on the reference ranges calculated in some other population?" Based on this question, recently, we conducted a study addressing this issue that "What should be the optimum level of Vitamin D in our population?"

The main function of Vitamin D is to facilitate Ca^{2+} absorption from the intestine [7]. The optimum level of Vitamin D is defined as the one where there is a maximum absorption of Ca^{2+} from the intestine. Sr is being successfully used as a suitable and reliable surrogate marker for the calculation of intestinal Ca^{2+} absorption [8,9]. We calculated Sr absorption from intestine at various Vitamin D levels. After this determination at basal conditions, the patients with deficiency (according to current reference ranges) were administered Vitamin D injection. This intervention markedly increased the levels of Vitamin D. However, the intriguing finding that there was absolutely no difference in the intestinal absorption of Sr before and after the intervention [10]. One interpretation of this finding could be that Sr absorption was already optimum at Vitamin D levels, which are considered low according to the current reference ranges. Increasing Vitamin D levels further could not result in improvement of Sr absorption. It is conceivable that if deficiency is so severe and at such scale in certain populations, natural selection must have gradually reduced the requirements of Vitamin D in one way or another. Indeed, there are few studies which have evidently reported adaptive mechanisms prevalent among population with presumed Vitamin D deficiency. For example, Sellers et al. [11] reported that the Ca^{2+} absorption is more efficient in dark-skinned people with apparently low Vitamin D levels. They suggested that this is perhaps because of receptors that bind more strongly to the vitamin D molecule. On a similar note, it has also been shown that persons with low 25(OH) D show efficient conversion to its active form 1,25(OH)2D [12].

Concluding, the present findings compel for further studies aimed to understand the differences in Vitamin D metabolism among various populations. It is likely that due to adaptations to environment, apparent wide spread deficiency of Vitamin D might be optimum level for certain populations. Before pathologizing South Asian and Middle Eastern populations, further studies are required to validate and well-define the population-specific reference values for Vitamin D.

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