

Vitamin D: An Eye Superhero?

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Nowadays vitamin D is considered a supervitamin, moreover, it is considered a hormone (target distant and different organs). Vitamin D is a fat-soluble vitamin that is produced endogenously when ultraviolet rays from sunlight strike the skin and trigger vitamin D synthesis (sunshine vitamin: 90% originates from the skin and 10% from food). It is also present in very few foods (Fatty fish: like tuna, mackerel, and salmon. Cheese. Egg yolks). Vitamin D must undergo two hydroxylations in the body for activation (first in the liver: 25-hydroxyvitamin D the second in the kidney: 1,25-dihydroxyvitamin D (1,25[OH]2D) [1]. Vitamin D is essential for bone growth and bone remodelling [1,2]. Vitamin D has other very important roles in the body: regulation of cell growth, facilitating normal immune system function, and control of inflammation [1-4]. Many genes encoding proteins that regulate cell proliferation, differentiation, and apoptosis are modulated in part by vitamin D [1]. Many cells have vitamin D receptors, and some convert 25[OH]D to 1,25[OH]2D. Serum concentration of 25[OH]D is the best indicator of vitamin D status [1]. Serum 25[OH]D levels do not indicate the amount of vitamin D stored in body tissues. Serum 1,25[OH]2D is generally not a good indicator of vitamin D status because it has a short half-life of 15 hours and are closely regulated by parathyroid hormone, calcium, and phosphate [5]. Levels of 1,25[OH]2D do not typically decrease until vitamin D deficiency is severe [2,6]. Vitamin D deficiency can make some diseases more severe and vitamin D can be an important piece in the treatment of some diseases. Vitamin D deficiency is associated with an increased risk of diseases such as bone disorders, inflammatory bowel disease, tumors, rheumatoid arthritis, cardiovascular diseases, diabetes and Vitamin D deficiency tied to risk for diabetes death [7,8]. The interest in vitamin D within ophthalmology coincides with findings that many people (of different ages, even in sunny countries) are deficient or insufficient in vitamin D (an unrecognized global epidemic). The connection between vitamin D levels and eye disease is not yet fully understood. Epidemiological studies show that vitamin D can protect vision as well, preventing ocular diseases, such as dry eye, cataracts, myopia, uveitis, age-related macular degeneration (AMD), glaucoma and diabetic retinopathy. However, the underlying mechanism is still controversial. For example, there have been studies regarding vitamin D and AMD that find increased risk for AMD when there is vitamin D deficiency because vitamin D has anti-inflammatory-immunogenic properties that prevent angiogenesis [9]. Other studies did not find a significant association between vitamin D deficiency and AMD [10]. Myopia is very common today, all over the world. Several studies have proven a correlation between vitamin D deficiency and myopia [11,12]. Others consider that analyses do not provide support for the hypothesis that elevation of vitamin D levels is the mechanism by which spending time outdoors protects against myopia [13]. Vitamin D is one of the essential nutrients. With an aging population, vitamin D deficiency dramatically increase. Vitamin D deficiency is closely associated with many chronic and ocular diseases: it will be important to clarify whether vitamin D deficiency is the etiology or only the consequence of chronic diseases. More research are needed, while for the vast majority of healthy people vitamin D levels of 20 ng/ml are right, however, many individuals will need higher doses.

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