

## Is it Wise to Relay on Sun Exposure to Get Your Vitamin D Requirement?

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### Abstract

Vitamin D deficiency is encountered in the daily practice. A lot of physicians still advise their patients to get exposed to the sun to have their vitamin D dose. This review article spots the light on some facts- about vitamin D sources- that could help the physician in making their decision in treating vitamin D deficiency. Although sun exposure is the main natural source of vitamin D, many factors decreases the amount of vitamin D formed beside its carcinogenic effect on the skin. Vitamin D supplements are available in the market. Physicians can choose between them and be guided by regular checking of 25-OH-D3 level in the blood.

Vitamin D is a fat-soluble vitamin that exerts many benefits to the human body which includes enhancing calcium absorption from the intestine and maintain adequate serum calcium and phosphorus concentration, modulation of neuromuscular and immune function and reducing inflammation. Some genes encoding proteins that regulate cell proliferation, differentiation and apoptosis are regulated partly by vit D [1].

Vitamin D has 2 main sources, a natural source and an artificial one.

## Natural sources

Sun light is the main natural source. Vitamin D<sub>3</sub> is synthesized in the uncovered skin by the influence of solar Ultraviolet B (UVB) rays with a wavelength of 290–320 nanometers. 7-dehydrocholesterol found in the skin absorbs UVB and converts to pre-vitamin D<sub>3</sub>. It is subsequently hydroxylated in the liver to 25-hydroxyvitamin D. Finally, it is hydroxylated again in the kidney to form 1,25-dihydroxyvitamin D<sub>3</sub> (calcitriol) [2].

Several factors affect Vit D synthesis in the skin; time of the day, amount of melanin pigment in the skin, surface area of the exposed skin, wearing sunscreen and the presence of cloud, fog and pollution in the atmosphere.

Air pollution reduced the amount of UVB by 60%, while complete clouds decrease it by 50%. Exposure to sun through glass blocks the UVB [3].

The amount of UVB radiation differs along the day and from area to another. It was measured in most areas to be between 10 AM to 3 PM. The surface area of exposed skin and the duration of exposure are matters of great debate. It is stated that 5-30 minutes of sun exposure of the face, arms, legs, hand and back twice a week in moderately toned skin is sufficient to form enough amount of Vit D [4].

Theoretically, Sunscreens of SPF 8 and above block UVB rays but practically, most people don't apply the sunscreen in the proper amount and frequency, so some Vit D could be formed in the skin covered with sunscreens.

Ultraviolet (UV) radiation is a proven human carcinogen [5].

A UK study had reported that about 86% of melanoma cases were attributed to UV radiation from the sun [6].

Vit D is found in very little amount in some food like the Fatty fish such as salmon, tuna, and mackerel, fortified milk, juices and cereals, eggs and mushroom. One spoon of Cod liver oil gives about 1360 IU of Vit D [7].

## Dietary supplements

Supplementary Vitamin D is present in 3 main forms; D<sub>3</sub> (cholecalciferol), D<sub>2</sub> (ergocalciferol) or alfacalcidol. Although the peak serum concentration of ergocalciferol is reached after 3 days compared to 14 days of cholecalciferol, it was estimated that cholecalciferol elevates the 25-OH-D<sub>3</sub> 3 times better than ergocalciferol and maintain it for a longer time [8].

Alfacalcidol is the active form of Vit D, it is found in the form of drops, syrup and tablet form. It is the recommended form to be given to patients with renal problems and failure. To choose the source of Vit D, you must consider the pros and cons of each source. Sun exposure is the main source, but it is carcinogenic, affected by pollution, cloud, shades and wearing sunscreens.

Cumulative effect to sun predisposes to aging changes and wrinkles. It's therefore advisable to limit sun exposure and tan beds [9,10]. Practically, it's better to relay on supplementary Vit D in the form of cholecalciferol in the daily recommended dose, and for those with renal problem, Alphacalcidol is the supplement of choice. Keep an eye on 25(OH)D level targeting the sufficiency level of 30 ng/mL (75 nmol/L) and above.

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