



The Sunshine Vitamin : In a Nutshell

Vitamin D3 is a fat soluble vitamin needed for different functions in the body. It is synthesized in the body when UV (UV-B) rays falls on the skin. In the skin, ultraviolet light catalyzes conversion of 7-dehydrocholesterol to Vitamin D3, which is released into the blood. The sunlight exposure can be the most important determinant of Vitamin D concentrations.

Different Roles of Vitamin D3

Optimum levels of Vitamin D3 is crucial for many body functions. Some of them are mentioned below:

- Maintenance of normal blood levels of calcium and phosphorus
- Muscle Contraction
- Boosts Mood
- Nerve Conduction
- Lower Blood Pressure
- Immune Function
- Facilitates Weight Loss

Diagnostic cut-offs of levels of serum Vitamin D

Vitamin D status	The serum level of Vitamin D in ng/ml
Deficiency	<20
Insufficiency	21-29
Sufficiency	>30
Toxicity	>150

Causes of Vitamin D3 Deficiency

There are many reasons for Vitamin D3 deficiency being so common in our country. Some of them are listed below:

- Increased indoor lifestyle, thereby preventing adequate exposure to sunlight. This is mainly in the urban population due to modernization.
- Pollution can hamper the synthesis of Vitamin D in the skin by UV rays.
- Changing food habits contribute to low dietary calcium and Vitamin D intake.
- Phytates and phosphates which are present in fiber rich diet, can deplete Vitamin D stores and increase calcium requirement.
- Increased skin pigmentation and application of sunscreens.
- Unplanned pregnancies in women with dietary deficit can lead to worsening of Vitamin D status in both mother and child.

Consequences of Vitamin D Deficiency

Skeletal manifestations:

The most common result of Vitamin D deficiency are rickets in children and osteomalacia and osteoporosis in adults. It also causes muscle weakness and bone pain. Many studies have shown an association between low Vitamin D concentrations and an increased risk of fractures and falls in older adults.



Depression:

Low levels of Vitamin D can lead to Depression. Optimum Level of Vitamin D are required for the management of depression.



Parkinson's disease:

Vitamin D insufficiency was seen in patients with Parkinson's disease (PD). Vitamin D acts as a potential preventive/therapeutic strategy for Parkinson Disease. However, there is a need for further studies on Vitamin D receptors as well as its interaction with Vitamin D levels in PD.



Infectious disease:

Infectious disease such as tuberculosis, upper respiratory tract infections of viral origin, i.e., influenza is seen in individuals with Vitamin D deficiency



Autoimmune diseases:

Vitamin D is a potent modulator of immune system. Supplementation of Vitamin D resulted in 30% reduction in the risk of developing Type 1 diabetes mellitus. Lower levels of Vitamin D were found to be associated with rheumatoid arthritis.



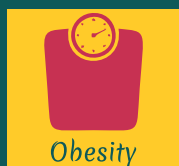
Cancer:

Vitamin D has a protective role in certain tissues by promoting cell death. Low level of Vitamin D are associated with cancers. It stops the growth of new blood vessels and has significant anti inflammatory effects.



Obesity:

Levels of Vitamin D are inversely associated with body mass index, waist circumference, and body fat but are positively associated with age, lean body mass, and Vitamin D intake.



Type 2 diabetes mellitus:

Vitamin D deficiency has been associated with increased risk of type 2 diabetes mellitus, insulin resistance, and decreased insulin production. Evidence reveals that Vitamin D reduces the risk of progression and development of type 2 diabetes mellitus.



Heart disease:

In the Framingham Heart Study, patients with low Vitamin D concentrations (<15ng/ml) had a 60% higher risk of heart disease than those with higher concentrations. Severe Vitamin D deficiency is seen in patients with acute myocardial infarction (heart attack) and it is associated with many of its risk factors.



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For Further Investigation, You need to consult your Doctor for understanding your Vitamin D Status