

Review Article

A Review on Sunshine Vitamin

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ABSTRACT

Vitamins are chemical substances that perform specific functions in the body. They are considered essential nutrients because our bodies cannot produce them and, therefore, we must consume them in our diets. Most humans depend on sun exposure to satisfy their requirements for vitamin D. Vitamin D deficiency is an unrecognized epidemic among both children and adults. Vitamin D deficiency causes rickets among children and osteoporosis among adults. New research now links low vitamin D levels to heart disease risk factors, like high blood pressure and diabetes, some types of cancer, infection and autoimmune disease. If it's a sunny and pleasant day, find a way to take sunshine vitamin as much as possible.

INTRODUCTION

Vitamin D is often called "the sunshine vitamin." However, it also is a hormone. When the ultraviolet rays hit our skin, our bodies can make vitamin D, but unprotected sun exposure can lead to skin cancer and wrinkles. Without enough sun exposure, dietary sources of vitamin D are needed, including fatty fish, fortified foods and dietary supplements. Vitamin D insufficiency affects almost 50% of the population worldwide. New research has shown that vitamin D deficiency is epidemic in American adults today, suggesting that up to 90 percent of North Americans are vitamin D deficient. One of the major roles of vitamin D, which is also a hormone, is to regulate our blood calcium levels. Our skeleton acts as a calcium reserve. When calcium intake is low, our blood calcium level is maintained at the expense of our bones. Inadequate vitamin D sets the stage for loss of calcium from the bones which can result in fractures from osteoporosis. Once vitamin D is produced in skin or consumed in our food, it requires chemical conversion in the liver and kidney. Calcitriol is the primary form of vitamin D in the body; it is converted from calcidiol in the kidneys. Calcitriol then travels to various parts of the body to do its work. Vitamin D stimulates maturation of cells, including immune cells that defend against disease. Vitamin D also acts on genes, affecting how cells grow, multiply, and specialize.

To replenish blood calcium, vitamin D acts at three body locations to raise blood calcium levels:

1) Skeleton, 2) digestive tract - where food brings in calcium, and 3) kidneys - which can recycle calcium that would otherwise be lost in urine.

What is Vitamin D?

Vitamin D is a nutrient specifically required for bone health, but also important for overall physical health. Vitamin D helps our body absorb calcium and phosphorus which are nutrients that make our bones strong. Rickets is the disease in children characterized by softened and weakened bones. Vitamin D is found in two forms. Vitamin D3 is the form made following sunlight exposure while vitamin D2 is the form found in dietary supplements and fortified in many food items. Foods naturally high in vitamin D include Salmon, Sardines, Eggs, Fortified milk, Fortified orange juice, Fortified cereal...

How much vitamin D do you need?

Recommended vitamin D intakes for individuals

Life stage	Average daily recommended amounts in International Units (IU)
Birth to 12 months	400
Children 1-13 years	400
Teens 14-18 years	600
Adults 19-50 years	600
Adults 51-70 years	600
Adults 71 years and older	800
Pregnant and breastfeeding women	600

Health Factors**Bone Health / Osteoporosis**

Over 88 % of individuals treated for osteoporosis had low vitamin D levels. Low levels of Vitamin D are associated with increased pain, disability, and fracture risk.

Muscle Strength

Vitamin D correlates with leg strength in people over 60 years of age. Research showed that women performed dramatically better on strength tests and had only about half as many falls while taking vitamin D compared to those not taking vitamin D.

Fibromyalgia

Muscle and bone aches are symptoms of vitamin D deficiency. It is thought that 40-60% of patients with fibromyalgia may instead have a vitamin D deficiency.

High Blood Pressure

Proper Vitamin D levels help to maintain healthy blood pressure.

Autoimmune Diseases

Adequate vitamin D may inhibit the development of autoimmune diseases, including Multiple Sclerosis, rheumatoid arthritis, type 1 diabetes, etc... The hormone from vitamin D has been shown to inactivate a type of immune cell that drives autoimmune disorders.

Diabetes Type II

Diabetes Type II is more common in those with low blood concentrations of vitamin D. Vitamin D is important in both the production of insulin and in the effectiveness of insulin. Normalizing vitamin D has been shown to improve insulin sensitivity and lower blood sugars by 20-40 my/dL.

Cancer

Colon, prostate, and breast cancer risks may be lowered by as much as 50% with proper vitamin D intakes.

Depression

If you experience anxiety, depression, sadness, irritability, increased carbohydrate cravings, or an increase in appetite during the winter months you could have Seasonal Affective Disorder or SAD. SAD can be relieved with optimal levels of vitamin D.

Other symptoms

Fatigue, insomnia, sweating, diarrhea, muscle aches, and nervousness have all been related to vitamin D deficiency.

Amount of Vitamin D present in Foods

Food	Serving Size	Average IU of Vitamin D
Egg Yolk	1 yolk	27
Liver (beef or chicken)	3 oz.	42
Some Fortified Cereals (check label)	1 cup	40-60
Vitamin D fortified Milk	1 cup	100
Some Fortified Yogurts (check label)	1 cup	100
Some Fortified Orange Juice	1 cup	100
Shrimp	3 oz.	127
Tuna	3 oz.	150
Salmon	3 oz.	340
Multi-vitamin and Mineral Supplement	1 tablet	400 Amount varies, check label

Functions of Vitamin D

Calcium and Vitamin D work together to help maintain healthy bones and teeth. Vitamin D promotes calcium absorption in the gut and maintains adequate serum calcium and phosphate concentrations to enable normal mineralization of bone and to prevent hypocalcemic tetany. It is also needed for bone growth and bone "remodeling".

Vitamin D sufficiency prevents rickets in children and osteomalacia in adults. Together with calcium, vitamin D also helps protect older adults from osteoporosis.

DETECTION OF VITAMIN D DEFICIENCY

The only way to determine whether a person is vitamin D (vitamin D represents either

vitamin D2 or vitamin D3) sufficient, deficient, or intoxicated is to measure the circulating concentrations of 25(OH) D (2, 3, 22). 25(OH) D, which is produced in the liver, is the major circulating form of vitamin D.

CONCLUSION

Vitamin D should be considered essential for overall health and well-being. Vigilance in maintaining a normal vitamin D status, i.e., 25(OH) D concentrations of 75–125 nmol/L, should be a high priority. Surveillance for vitamin D deficiency, with measurement of 25(OH) D concentrations, should be part of normal yearly physical examinations.

The effect of vitamin D on bone health is clear. Physicians should consider measuring the 25-hydroxyvitamin D levels of patients at risk of vitamin D deficiency (including those with low sun exposure, low dietary intake, or who suffer from conditions or take medicines that decrease fat absorption) and advise those with levels < 20 ng/mL on ways to improve their vitamin D status.

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