

SUNSHINE VITAMIN-VITAMIN D

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ABSTRACT

Vitamin D is popularly known as Sunshine Vitamin as it is synthesized in the body through its exposure to sunlight. Very few foods naturally contain vitamin D, and foods that are fortified with vitamin D are often inadequate to satisfy either a child's or an adult's vitamin D requirement. Vitamin D deficiency causes rickets in children and will precipitate and exacerbate osteopenia, osteoporosis, and fractures in adults. The major cause of vitamin D deficiency is the lack of sun exposure. In today scenario the life is too hectic & restricted to small homes & offices. Everybody is so engaged in daily routine activities that he or she have no time to go out in the sun. Even during travel from home to office or back everybody prefers to cover all the body parts to restrict sunlight & apply sunscreen lotions. So this lifestyle adversely affects the requisite absorption of Sunlight that can convert the pro Vitamin D into active Vitamin D. In moderation is the major source of vitamin D for most humans. Vitamin D deficiency has been associated with increased risk of common cancers, autoimmune diseases, hypertension, and infectious diseases.

I. INTRODUCTION

Vitamin D pertains to group of fat-soluble secosteroids helps in increasing intestinal absorption of calcium, iron, magnesium, phosphate, and zinc. Vitamin D is inactive biologically when taken through diet or prepared in human body through sunlight exposure. It is also commonly known Sunshine Vitamin. Vitamin D is a fat-soluble vitamin & belongs to a family of compounds which includes vitamins D-1, D-2, and D-3.

There has been some controversy over the doses of vitamin D needed for healthy person. Recent research shows that you need more vitamin D than was once thought. Normal blood serum levels contain from 50 to 100 micrograms per deciliter. Your vitamin D intake needs may be altered, Depending on blood level.

II. ACTIVE VITAMIN D

The body converts vitamin D, whether taken orally or synthesized in the skin to a compound called 25-hydroxyvitamin-D[25(OH) D]. The body converts up to 100 mg of 25(OH) D everyday into a compound called calcitriol which is an active form of vitamin D which helps the body for decoding of DNA blueprints for over 200 human genes.

The Institute of Food and Agricultural Sciences reports new intake recommendations based on international units (IUs) per day.

The recommended IUs for vitamin D are:

- Children and teens: 600 IU
- Adults up to age 70: 600 IU
- Adults over age 70: 800 IU
- Pregnant or breastfeeding women: 600 IU

Getting a sufficient amount of vitamin D is important for normal growth of bones and teeth, as well as improved resistance against certain diseases.

Vitamin D has many important functions. The most vital are regulating the absorption of calcium and phosphorous & facilitating normal immune system function.

In today scenario the life is too hectic & restricted to small homes & offices. Everybody is so engaged in daily routine activities that he or she have no time to go out in the sun. Even during travel to distant places or home to office or back everybody prefers to cover all the body parts to restrict sunlight.

So this lifestyle adversely affects the requisite absorption of Sunlight that can convert the pro Vitamin D into active Vitamin D. If you shun the sun, suffer from milk allergies, or adhere to a strict vegan diet, you may be at risk for vitamin D deficiency.

It is also occurs naturally in a few foods -- including some fish, fish liver oils, and egg yolks -- and in fortified dairy and grain products.

III. CAUSES OF VITAMIN D DEFICIENCY

Vitamin D deficiency can occur due to number of reasons:

You are not consuming the recommended doses of the vitamin over time or following a strict vegan diet, because most of the natural sources are animal-based, including fish and fish oils, egg yolks, fortified milk, and beef liver.

Secondly as we have already discussed, exposure to sunlight is limited. Because the body makes vitamin D when your skin is exposed to sunlight & use of Sunscreen lotions & spending more time indoors are the major causes

The pigment melanin reduces the skin's ability to make vitamin D in response to sunlight exposure. Studies show that older adults with darker skin are at high risk of vitamin D deficiency.

Pollution is another cause which results in Vitamin D deficiency.

Kidneys cannot convert vitamin D to its active form. With ageing kidneys are less able to convert vitamin D to its active form increasing risk of vitamin D deficiency.

Digestive tract cannot adequately absorb vitamin D in case of certain diseases like Crohn's disease, cystic fibrosis, and celiac disease can affect your intestine's ability to absorb vitamin D from the food we eat.

Obesity is also assumed to be another reason for deficiency of Vitamin D, altering its release into the circulation.

People with a body mass index of 30 or greater often have low blood levels of vitamin D.

3.1 Symptoms of Vitamin D Deficiency

- General tiredness, aches and pains, and a general sense of not feeling well
- Sleep Disturbances & Poor Concentration
- Weakness & Cramps

- Severe bone or muscle pain & weakness that may cause difficulty in climbing stairs & getting up from the floor or from the low chair.

- Stress fractures, especially in the legs, pelvis, and hips

In severe cases low blood levels of the vitamin have been associated with the following:

- Increased risk of death from cardiovascular disease
- Severe vitamin d deficiency may cause rickets in children and ostiomalacia and osteoporosis in adults
- Cognitive impairment in older adults
- Severe asthma in children
- Cancer

3.2 Treatment for Vitamin D Deficiency

Doctors diagnose the vitamin D deficiency by doing a simple blood test. If you have a deficiency, your doctor may order X-rays to check the strength of your bones.

Treatment for vitamin D deficiency includes getting vitamin D through diet and supplements. Although there are no consensus on vitamin D levels required for optimal health & differs depending on age and health conditions. Concentration of less than 20 Nano grams per milliliter is generally considered inadequate, requiring treatment.

Spending more time in the sun or always helps to increase Vitamin D levels. "If you're going to get it from the sun, about 20 to 25 minutes of exposure is helpful.

The sun is less likely to provide your daily needs at higher latitudes in hills & in the winter, or if you are older or dark skinned (skin pigment blocks light and the process is less efficient with age).

Some food items contain vitamin D naturally. This means that vitamin D has been added. Foods that contain vitamin D include:

- salmon
- sardines
- egg yolk
- shrimp
- milk (fortified)
- cereal (fortified)
- yogurt (fortified)
- orange juice (fortified)

It can be hard to get enough vitamin D each day through sun exposure and food alone, so taking vitamin D supplements can help.

Guidelines from the Institute of Medicine increased the recommended dietary allowance (RDA) of vitamin D to 600 international units (IU) for everyone ages 1-70, and raised it to 800 IU for adults older than age 70 to optimize bone health. The safe upper limit was also raised to 4,000 IU. Doctors may prescribe more than 4,000 IU to correct a vitamin D deficiency.

Fatty fish can be a good source of vitamin D. Common options include salmon, trout, mackerel, tuna, and eel.

A 3-ounce sockeye salmon fillet contains about 450 international units (IUs) of vitamin D—a good portion of the 600 IUs that is the Institute of Medicine's recommended dietary allowance (800 IUs if you're over 70).

Certain mushrooms have the capacity to produce vitamin D when exposed to ultraviolet light. Mushrooms, however, are usually grown in the dark and don't contain the vitamin. Specific brands, however, are grown in ultraviolet light to increase vitamin D production.

Fortified cow's milk with vitamin D, but ice cream and cheese are not beneficial. In general, an 8-ounce glass of milk contains at least 100 IUs of vitamin D, and a 6-ounce serving of yogurt contains 80 IUs, but the amount can be higher depending on how much is added.

Some types of orange juice are also helpful. You can get vitamin D from fortified orange juice. One 8-ounce glass of fortified juice usually has around 100 IUs of vitamin D.

Eggs are a convenient way to get vitamin D. They are popular in many breakfast, lunch, dinner, and dessert recipes. Since the vitamin D in an egg comes from its yolk, it's important to use the whole egg not just the whites. One yolk will give you about 40 IUs, but don't try to get your daily vitamin D just from eggs.

One egg contains about 200 milligrams of cholesterol, and it is not recommended of consuming more than 300 milligrams a day for heart health.

Vitamin D supplements can help you get your proper daily dose.

Cod Liver Oil is often flavored with mint or citrus, or comes in capsule form.

One tablespoon contains about 1,300 IUs of vitamin D, which is more than twice the recommended dietary allowance of 600 IUs per day. That amount doesn't exceed the maximum upper-level intake of 4,000 IUs for people over 8 years old, but it exceeds the daily maximum for infants (1,000 IUs).

People at high risk of vitamin D deficiency may resort to UV-emitting lamps and bulbs. This includes people unable to absorb the vitamin or those who can't get enough in winter months.

Too much vitamin D can be toxic, however. The IOM sets the upper limit at 4,000 so always talk to your doctor before choosing a dosage.

IV. HEALTH BENEFITS OF VITAMIN D

This section looks at the potential health benefits of vitamin D, from assisting good bone health to possible cancer prevention.

4.1 Healthy bones

Vitamin D plays a substantial role in the regulation of calcium and maintenance of phosphorus levels in the blood, two factors that are extremely important for maintaining healthy bones. We need vitamin D to absorb calcium in the intestines and to reclaim calcium that would otherwise be excreted through the kidneys.

Vitamin D deficiency in children can cause rickets, a disease characterized by a severely bow-legged appearance triggered by impaired mineralization and softening of the bones.

In adults, vitamin D deficiency manifests as osteomalacia or osteoporosis. Osteomalacia results in poor bone density, muscular weakness and often causes small pseudo fractures of the spine, femur and humerus. Osteoporosis is the most common bone disease among post-menopausal women and older men.

4.2.Prevention from flu

Children given 1,200 IU of vitamin D per day for 4 months during the winter reduced their risk of influenza.

4.3. Decreased risk of diabetes

Several observational studies have shown an inverse relationship between blood concentrations of vitamin D in the body and risk of type 2 diabetes. In type 2 diabetics, insufficient vitamin D levels may have an adverse effect on insulin secretion and glucose tolerance.³ In one particular study, infants who received 2,000 IU/day of vitamin D had an 88% lower risk of developing type 1 diabetes by the age of 32.

4.4.Healthy infants

Children with normal blood pressure who were given 2,000 IU/day had significantly lower arterial wall stiffness after 16 weeks compared with children who were given only 400 IU/day.

Low vitamin D status has also been associated with a higher risk and severity of atopic childhood diseases and allergic diseases, including asthma, atopic dermatitis and eczema. Vitamin D may enhance the anti-inflammatory effects of glucocorticoids, making it potentially useful as a supportive therapy for people with steroid-resistant asthma.

4.5 Healthy pregnancy

Pregnant women who are deficient in vitamin D seem to be at greater risk of developing preeclampsia and needing a cesarean section. Poor vitamin D status is also associated with gestational diabetes mellitus and bacterial vaginosis in pregnant women. It is also important to note that vitamin D levels that were too high during pregnancy were associated with an increase in food allergy of the child during the first two years of life.

4.6.Reduced Risk of Cancer

Vitamin D is extremely important for regulating cell growth and for cell-to-cell communication. Some studies have suggested that calcitriol (the hormonally active form of vitamin D) can reduce cancer progression by slowing the growth and development of new blood vessels in cancerous tissue, increasing cancer cell death and by reducing cell proliferation and metastases. Vitamin D has an influence on more than 200 human genes, which can be impaired when D status is suboptimal.

V. VITAMIN D OVERDOSES

A vitamin D overdose occurs when the body retains enough of the vitamin to reach toxic levels, caused by taking supplements, according to Mayo Clinic. Reaching the toxic level requires ingesting and producing 50,000 international units daily for several months, which is not possible with diet and sun exposure alone.

A vitamin D overdose from sunlight is not possible because the body regulates the amount of vitamin D it produces. Diet is not a problem, because even fortified foods contain a relatively small amount of vitamin D. Among individuals who take supplements, reaching the overdose level is rare, because 50,000 international units is much greater than the recommended daily allowance of 600 international units, according to Mayo Clinic.

The primary side effect of a vitamin D overdose is a buildup of calcium in the blood, reports Mayo Clinic. The excess calcium causes gastric upset and issues with the kidneys. Treatment for a vitamin D overdose includes stopping the supplements. Depending on the level of toxicity, the doctor may prescribe intravenous fluids and medications.

While an overdose of vitamin D is rare, even with people who use supplements, it is more likely with people who have other health problems, Mayo Clinic indicates. Kidney and liver conditions along with taking diuretics for blood pressure control increase the chance of the body retaining enough vitamin D to reach toxic levels.

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