The Effects of Vitamin D Deficiency

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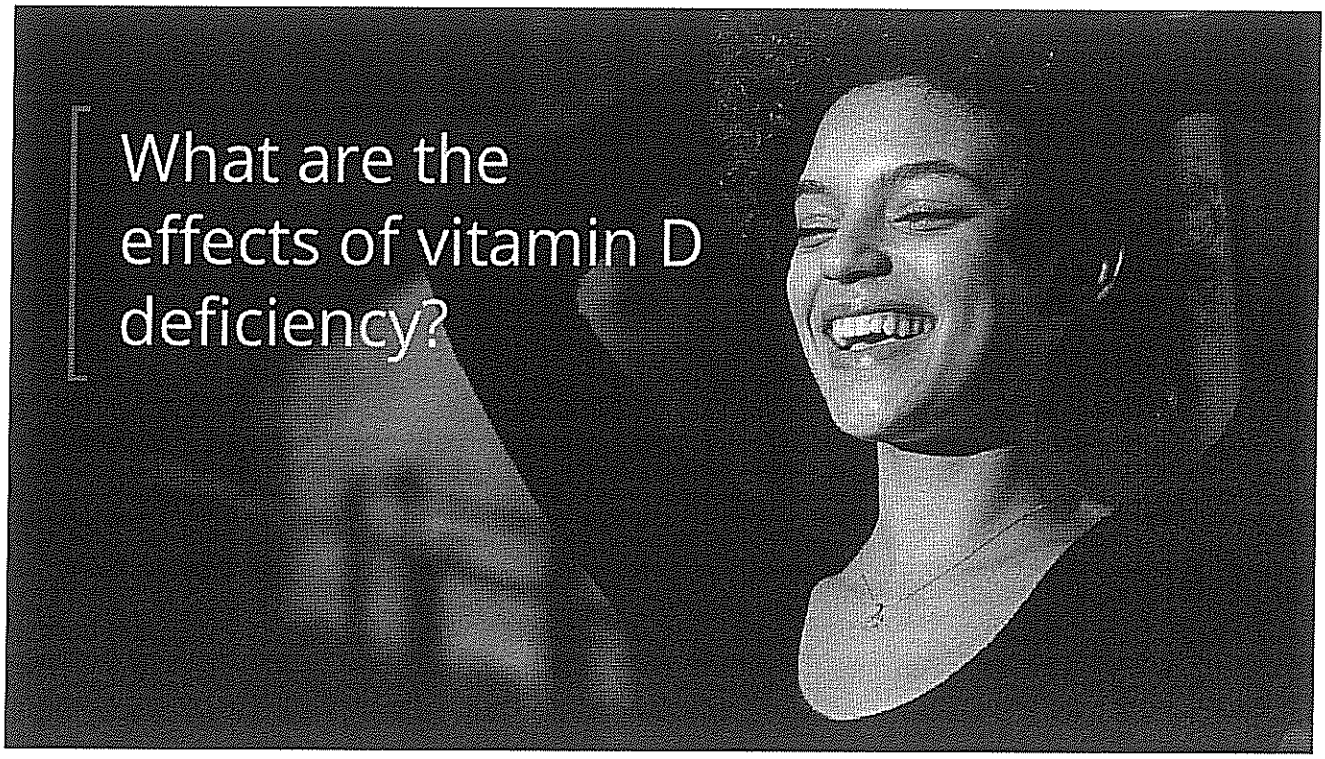

What is the purpose of vitamin D in the body?

Known as the "sunshine vitamin," vitamin D is a vitamin you can get from food or supplements. Exposure to the sun also stimulates vitamin D production in the skin.

Vitamin D serves several important functions in the body. These include:

- promoting calcium absorption
- maintaining normal calcium and phosphate levels
- promoting bone and cell growth
- reducing inflammation

According to Harvard University, an estimated 1 billion people are low in vitamin D. Vitamin D deficiencies can cause short-term symptoms and long-term complications.

Symptoms

What are the symptoms of vitamin D deficiency?

Vitamin D deficiency doesn't always cause symptoms. When it does, some of the symptoms may include:

- difficulty thinking clearly
- bone pain
- frequent bone fractures
- muscle weakness
- soft bones that may result in deformities
- unexplained fatigue

Many people don't develop symptoms until their vitamin D levels get very low or have been low for some time. This can make the condition difficult to diagnose.

Several factors have contributed to the rising incidence of vitamin D deficiency. These include:

- wearing sunscreen (sunscreen blocks the sun's ability to stimulate vitamin D production)
- not spending enough time outside
- having darkly pigmented skin, which won't absorb the sun's rays as well
- exclusively breast-feeding babies for prolonged time periods
- being obese, which typically raises your vitamin D requirements

Some people are born without the ability to process vitamin D. Other people have medical conditions that keep them from digesting vitamin D well.

Diagnosis

How is vitamin D deficiency diagnosed?

Your doctor will start by taking your health history to determine if you've been experiencing symptoms that could indicate vitamin D deficiency.

A doctor will likely order a blood test for the serum concentration of 25(OH)D. This is the type of vitamin D that circulates in the blood. It's considered a good reflection of how much vitamin D you've absorbed from sun exposure and taken in from foods.

Levels of vitamin D are expressed in nanomoles/liter (nmol/L) or nanograms/milliliter (ng/mL). According to the Office of Dietary Supplements (ODS), the results can indicate the following:

- deficiency: less than 30 nmol/L (12 ng/mL)
- potential deficiency: between 30 nmol/L (12 ng/mL) and 50 nmol/L (20 ng/mL)
- normal levels: between 50 nmol/L (20 ng/mL) and 125 nmol/L (50 ng/mL)
- high levels: higher than 125 nmol/L (50 ng/mL)

If your vitamin D levels are low and you're having symptoms of bone pain, a doctor may recommend a special scan to check for bone density. Doctors use this painless scan to evaluate a person's bone health.

Complications

What are the complications of vitamin D deficiency?

Researchers still aren't sure of all the possible complications of vitamin D deficiency.

One study found that vitamin D deficiency was a contributing factor in recurrent major depressive disorder with seasonal patterns. This is a form of depression that only occurs during certain times of year.

Another study found that vitamin D deficiency was linked with faster growth of breast cancer cells in mice.

Doctors do know that vitamin D deficiency can cause:

- impaired immune system functioning, which puts you at a higher risk for infection
- rickets, a condition that most commonly occurs in children that causes bone softening
- insulin resistance, which affects your ability to use insulin to process blood sugar
- thin or brittle bones, which increases your risk for osteoporosis

Treatment

How is vitamin D deficiency treated?

Doctors often treat vitamin D deficiencies by prescribing or recommending vitamin D supplements. The amount you should take usually depends on how low your vitamin D levels are. For example, some people may reach their vitamin D intake by taking a multivitamin. These usually have between 400 and 800 IU of vitamin D with each serving. However, people who are very deficient in vitamin D may need higher levels of supplementation — about 1,000 IU per day. Ask your doctor how much vitamin D you need every day.

The ODS recommends the following dietary allowances for eating foods that contain vitamin D as well as taking supplements:

- ages 0 to 12 months: 400 IU
- ages 1 to 70 years (including pregnancy and lactating): 600 IU
- ages 70 and older: 800 IU

Few unfortified foods in a person's diet are high in vitamin D. Foods that are naturally high in vitamin D include:

- fatty fish, such as mackerel, salmon, and tuna
- beef
- cheese
- egg yolks
- fish liver oils
- mushrooms

However, food manufacturers often add or fortify foods with vitamin D. Examples include:

- milk
- breakfast cereals
- yogurt
- orange juice
- margarine

Manufacturers also add vitamin D to some infant formulas to reduce the risk that infants will have low levels.

It's also possible to increase vitamin D levels by going outside more. About 15 minutes of sun exposure (without sunscreen on) is usually enough to build up vitamin D levels. Several factors can influence the amount of sun exposure you get, including the time of year, cloud cover, and the time of day (the sun's rays are more direct during the middle of the day). Another consideration is that ultraviolet B radiation can't

penetrate glass. This type of radiation is what stimulates vitamin D production. So even if you're taking in sunlight through a window, you won't get the benefit of vitamin D production.

Sunscreen is still very important to your health. If you're going to be outside for longer than 15 minutes, you should wear sunscreen to protect against the sun's damaging rays.

Outlook

What is the outlook for someone with vitamin D deficiency?

It's important to know that vitamin D deficiency usually can't be "cured" overnight. Also, it is possible to take too much vitamin D. There are two kinds of vitamins: water-soluble and fat-soluble.

Fat-soluble vitamins (like vitamins A, D, and E) are stored in the body's tissues. Water-soluble vitamins (like vitamins B and C) aren't usually stored in the body. This means that fat-soluble vitamins can build up to excess levels in the body, possibly causing side effects like damage to the kidneys and heart.

Do not take more than 4,000 IUs per day without talking to your doctor.

Prevention

How can vitamin D deficiency be prevented?

Some steps you can take to maintain healthy vitamin D levels include:

- getting out in the sun without sunscreen on for 15 minutes each day
- taking a multivitamin that contains vitamin D
- eating foods that are high in vitamin D
- purchasing and eating foods that are fortified with vitamin D, such as cereals and milk

Eating a healthy diet with fortified foods and getting some sun exposure when possible can help you keep your vitamin D at healthy levels.

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