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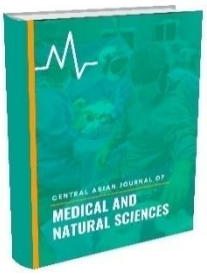

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The Effect of Vitamin D Deficiency in Women and its Symptoms and Treatment Methods

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Abstract: Dealing with the research on what is vitamin D and the method of its manufacture in the skin and what are its properties and the sources of the natural and fortified vitamin and the effect of deficiency in women and what are its symptoms and method of treatment.

Key words: Vitamin D.

Introduction

Vitamin D

It is one of the fat-soluble vitamins the main source of vitamin D is its biosynthesis through its action by exposure to sunlight, this in turn depends on several factors including latitude, duration and time of sun exposure, air pollution, clothing and skin pigmentation.(1)

Vitamin D is linked to bone and calcium metabolism and is specifically linked to maintaining calcium balance by regulating the absorption of calcium from the intestinal tract.(2)

And it is created by making ultraviolet rays coming from sunlight, vitamin D helps control calcium levels in the blood and helps maintain muscle strength, it stimulates gut to absorb more calcium from the food you eat, if you don't eat enough calcium, vitamin D is called calcium from the bones and the body retains calcium in the blood at a normal level, because calcium is very important in making the brain, lungs, muscles and heart perform their functions normally, this vitamin is one of the most important vitamins needed by the body, as it has an important role in the formation and density of bones in adults and causes rickets or curvature of the legs in children, it also causes bones and muscles and has a role in the prevention of cancer and some immune-related diseases.

The Process of Skin Making Vitamin D

The skin contains the precursor factors of vitamin D, called (vitamin D precursor) The skin absorbs the energy contained in UV B rays(3). and uses it to convert vitamin D precursors into vitamin D3, where it moves to the liver and undergoes a chemical process in which a pair of oxygen and hydrogen atoms are added to become hydroxyl vitamin D.25The vitamin moves from the liver to the kidneys, where , another pair of oxygen and hydrogen is added to become dihydroxyl vitamin D1.25, the ultimate vitamin that the body needs.(4).

Properties of Vitamin D

It is a white crystalline substance that dissolves in grease and fatty solvents Resists heat and is relatively stable towards oxidative stress Vitamin D has the synthesis of sterols in its chemical composition, chemically, there are eleven sterolic compounds that have the effectiveness of vitamin D, including two important compounds called the first compound. calciferol, the second compound is called activated cholesterol, and you can get it from foods rich in vitamin D, or supplements your body can go through sun exposure Vitamin D is essential for maintaining strong bones and teeth and maintaining a healthy immune system, facilitate the absorption of calcium and phosphorus Since vitamin D is not found naturally in many foods, most health professionals recommend getting at least 5-30 minutes of sun exposure per day or taking a supplement to meet the recommended daily amount of 600 IU or 15 micrograms, those who live far from the equator may not be able to meet their requirements through exposure to sunlight alone at certain latitudes, the skin can produce very little vitamin D for up to six months a year, unfortunately, nearly 50% of people worldwide suffer from low vitamin D.(5)

Sources of Vitamin D

1. Sunlight

Exposure to sunlight early in the morning or shortly before sunset, exposure for a period not exceeding 15 minutes

2. Some Natural Foods

Vitamin D is found in a group of natural foods, but their number is limited, as it is one of the vitamins scarce in foods

Among the most prominent sources of vitamin D from the following natural foods

Eggs, meat, oily fish such as salmon, sardines, tuna, orange, soy milk, yogurt, beef liver.

Some Fortified Foods

There are many foods that are not sources of vitamin D, but they are supported by vitamin D supplements in addition to them, and the most prominent of these foods are:

Infant formula

Milk powder

The Importance of Vitamin D in the Body

1. Promote Bone Health**:** Vitamin D plays a role in regulating calcium and maintaining phosphorus levels in the blood, which are necessary and important minerals for bone health, as the body needs vitamin D in order to absorb calcium, so a decrease in its levels would cause rickets in children and thinning or osteoporosis in adults.**(6)**
2. Reduce the risk of flu Vitamin D has a good role in fighting flu during the winter, where, one scientific study found that getting 200.1 IU of vitamin D per day in winter reduces the risk of flu by about 40%.
3. Protection from diabetes many different scientific studies have indicated that the relationship between vitamin D and type II diabetes means that getting the right levels of vitamin D and maintaining it will protect you, in contrast, low levels of vitamin D in diabetics can negatively affect insulin secretion and glucose tolerance.

4. Maintaining the health of infants it is necessary for the infant to get the appropriate levels of vitamin D in order to protect them from asthma, eczema and many different infections.
5. The benefits of vitamin D for a healthy pregnancy, as its low levels in pregnant women raise their risk of preeclampsia and gestational diabetes, and this is necessary to ensure that the level of the vitamin does not increase at the required limit for pregnant women because it may pose a risk to the health of pregnancy.
6. Reducing the risk of cancer Vitamin D is important in regulating the growth of body cells and communication between them, and this means that appropriate levels of vitamin D have an effect on reducing the risk of cancer.(7)

Normal Vitamin D Ratio in Women

Doctors measure the percentage of vitamin D in the blood through blood tests using one of two measurements: nanomol per liter (nanomol/L) or nanogram per milliliter (ng/ml).

The amount of vitamin D a person needs per day depends on their age. For most adults, the normal level of vitamin D in the blood is 20 nanograms per milliliter or more.

For pregnant or breastfeeding women they need 15 micrograms or 600 IU of vitamin D per day.

Symptoms of severe vitamin D deficiency in women(8).

1. Fatigue and Exhaustion

The reason why women feel tired can be caused by vitamin D deficiency. Many studies suggest that taking vitamin D can reduce the severity of fatigue in people who are deficient in it.

In one clinical trial conducted at the University Hospital Zurich, which aims to investigate the effectiveness of vitamin D in treating fatigue among healthy people with low levels of this vitamin in the blood, the average age of the participants was between 6 and 29 years, 53% were women, the result is a significantly lower average fatigue in the group that took vitamin D compared to the placebo group.

2. Bone and Back Pain

Vitamin D is vital for bone function and has anti-inflammatory effects. As a result, vitamin D plays an important role in relieving bone pain, especially when inflammation is the cause.

Some research links vitamin D deficiency to RA, a chronic inflammatory condition that affects joints.

3. Weakened Immunity

According to the National Center for Biotechnical Information, vitamin D has an important role in influencing immunity, in addition to its classic effects on calcium and bone balance. The reason for this is that vitamin D receptors are expressed in immune cells (B cells, T cells, antigen-presenting cells) these immune cells are all capable of synthesizing active vitamin D metabolites, so vitamin D has the ability to function in the immune environment.

Vitamin D can affect innate and adaptive immune responses, making vitamin D associated with increased susceptibility to infections.(9)

4. Delayed Wound Healing

Slow wound healing after surgery or injury is a sign that your vitamin D levels are too low, as vitamin D increases the production of compounds necessary for the formation of new skin as part of the wound healing process.

One study evaluating the effect of vitamin D supplementation on wound healing and metabolic status in patients with diabetic foot ulcers (DFU) involving 60 people with diabetic-related foot ulcers found that taking a 12-week vitamin D supplement led to significant improvement in wound healing.

5. Weight Gain

According to one study directed to find out whether the proportion of vitamin D in the body is associated with weight gain or increased waist circumference, a link was found between vitamin D deficiency and belly fat and weight gain, although these effects were more pronounced in men.

Although more studies are needed on the relationship between obesity and vitamin D deficiency in women to determine whether vitamin D supplementation helps prevent weight gain, vitamin D deficiency can be observed in cases of obesity.

6. Diabetes

There is a relationship between diabetes and vitamin D deficiency, and researchers believe this relationship is manifested in the role of vitamin D in insulin sensitivity and resistance, another possibility that vitamin D deficiency is linked to diabetes is its association with inflammation, because people with type 2 diabetes often experience more severe chronic inflammation.

A review published in March 2017 in the Biochemical Journal found that when vitamin D is deficient, many cellular processes in the body begin to break down, paving the way for the emergence of diseases such as diabetes.

7. Alzheimer's Disease and Dementia

A study published in the journal Neurology found that vitamin D deficiency is associated with a double risk of developing some forms of dementia, including Alzheimer's disease, among the symptoms of dementia is a decline in thinking and memory, which negatively affects daily life.

Alzheimer's disease is a more common form of dementia, accounting for up to 80 percent of dementia cases, according to the Alzheimer's Association, the above study analyzed more than 1,600 people aged 65 or older who did not have dementia at the start of the study.

Compared to people with normal vitamin D levels, those with low vitamin D levels have a 53 percent increased risk of developing dementia for all causes, the study authors also found that people with low levels of vitamin D were 70 percent more likely to develop Alzheimer's disease.

8. Severe Pain Before and During the Menstrual Cycle

Severe pain occurs before and during the menstrual cycle in up to 90% of women, which negatively affects the quality of life, especially when symptoms become severe. According to practical pain management, the most common causes of dysmenorrhea are:

- ✓ Uterine contractions caused by the withdrawal of progesterone at the beginning of menstruation.
- ✓ High levels of prostaglandins in menstrual fluid.
- ✓ High urinary leukotriene levels.

The most appropriate treatments based on the causes include: Drug therapy with NSAIDs. As for the association of menstrual pain with vitamin D deficiency, the American College of Obstetricians and Gynecologists (ACOG) reports that a 2012 clinical trial of vitamin D supplementation for dysmenorrhea found a significant reduction in the severity of menstrual pain among participants randomly selected for a single high dose of vitamin D orally.

9. Hair Loss

There are a range of factors that may lead to hair loss in women, these factors may be either disease, medications, or deficiencies in certain nutrients.

What interests us in this article is vitamin D deficiency, which has been considered a symptom of severe vitamin D deficiency in women, despite the lack of research on the subject.

Studies have linked vitamin D deficiency to alopecia areata, an autoimmune disease characterized by severe hair loss.

In another study of 48 people with alopecia areata, they were assessed for vitamin D.

Using a synthetic form of vitamin D topically for 12 weeks significantly increased hair growth.

10. Pregnancy

According to the Johns Hopkins Cicaron Center for Heart Disease Prevention, research in this area has found that pregnant women who develop vitamin D deficiency are more likely to have:

- ✓ Preeclampsia.
- ✓ Gestational diabetes.
- ✓ Negative pregnancy results.

Psychological Symptoms of Vitamin D Deficiency

Vitamin D is a steroid hormone that plays an important role in the growth and balance of the brain and the functions of the nervous system, this is due to its effect on the production and release of some neurotransmitters such as serotonin and dopamine. Here are some of the psychological symptoms of vitamin D deficiency:

1. Depression

According to one study, there is evidence showing a relationship between mood and vitamin D levels, as vitamin D deficiency has been linked to depression.

The study, published in April 2017 in The Journal of Diabetes Research, vitamin D supplementation has been shown to help improve the mood of women with type 2 diabetes, all women were given a high dose of vitamin D for six months, the final results conclude that there is a significant reduction in depression and anxiety and an improvement in mental health.

2. Anxiety

One review found that vitamin D levels were low in people with anxiety, as well as in people with depression.

The results of a study conducted on pregnant women also confirmed that having adequate levels of vitamin D may help with:

- ✓ Reduce anxiety symptoms.
- ✓ Improve sleep quality.
- ✓ Help prevent postpartum depression.

Symptoms of Vitamin D Deficiency on Muscles

One study found that 71% of people with muscle pain are actually deficient in vitamin D.

But how does that happen? In neurons called pain receptors, which sense pain, there are vitamin D receptors. Vitamin D is also involved in pain signaling pathways in the body, which may play a role in chronic pain.

High doses of vitamin D supplements can reduce pain in women with vitamin D deficiency.

The Most Serious Symptoms of Vitamin D Deficiency

Cross-sectional studies have reported that vitamin D deficiency is associated with an increased risk of:

- Cardiovascular diseases, including high blood pressure, heart failure and ischemic heart disease.

Preliminary prospective studies have also shown that vitamin D deficiency increases the risk of:

- Accidental hypertension or sudden cardiac death in individuals with pre-existing cardiovascular diseases.(10).

Treatment of Vitamin D Deficiency in Women

Vitamin D deficiency in women is usually treated with dietary supplements. Supplementation is the first treatment for over-the-counter vitamin D deficiency. These include:

- ✓ Magnesium: Helps activate vitamin D.
- ✓ High doses of vitamin Dali In case of severe deficiency, your doctor may recommend strong doses of up to 50,000 IU.
- ✓ Vitamin D injections.

Osteoporosis expert Dr. Joel Finkelstein, associate director at Massachusetts General Hospital, published a study of more than 2,000 perimenopausal women who were followed for nearly 10 years, the study found that women at this stage are more prone to vitamin D deficiency, so dietary supplements are justified in middle-aged women at levels below 20 ng/ml.

How to Compensate for Vitamin D Deficiency in Women

Erin Michos, associate director of the Johns Hopkins Cicaron Heart Disease Prevention Center, encourages women who want to compensate for vitamin D deficiency to:

- ✓ Exercise regularly indoors and outdoors to maintain a healthy weight (because obesity is associated with low vitamin D).
- ✓ Exposure to sunlight, 10 to 15 minutes in summer daily.
- ✓ Eat a healthy diet, including foods rich in vitamin D.

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