

THE HIDDEN EPIDEMIC OF VITAMIN D DEFICIENCY

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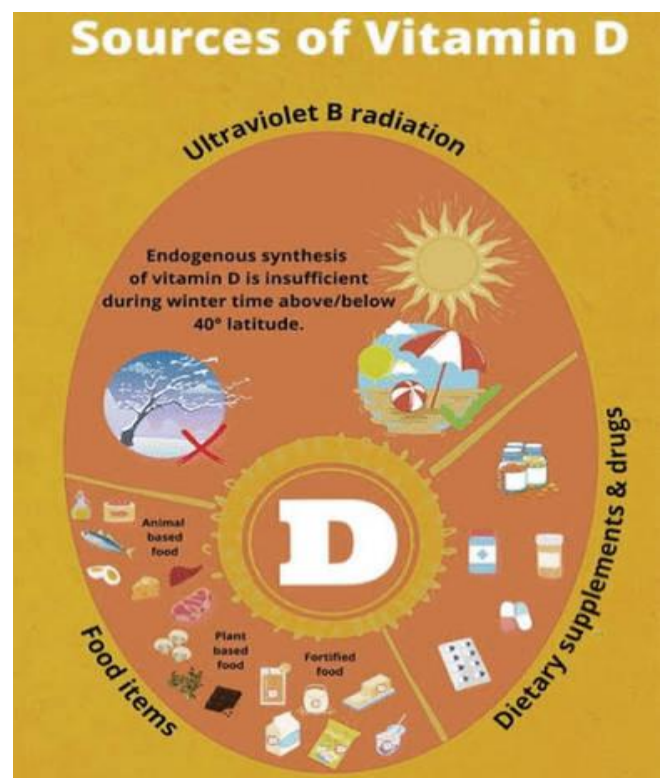
Abstract

Vitamin D deficiency is common in India, yet it often goes unnoticed and untreated. A lot of research is currently focused on this issue because of its link to various health problems.

Introduction

Vitamin D deficiency is a prevalent nutritional insufficiency in India, yet it often goes undetected and untreated. The insufficiency had an impact on individuals regardless of their gender, age, sex, ethnicity, or locality. Currently, there is significant research being conducted on vitamin D deficiency due to its involvement in different illnesses, in addition to its well-known effects on the skeletal system.

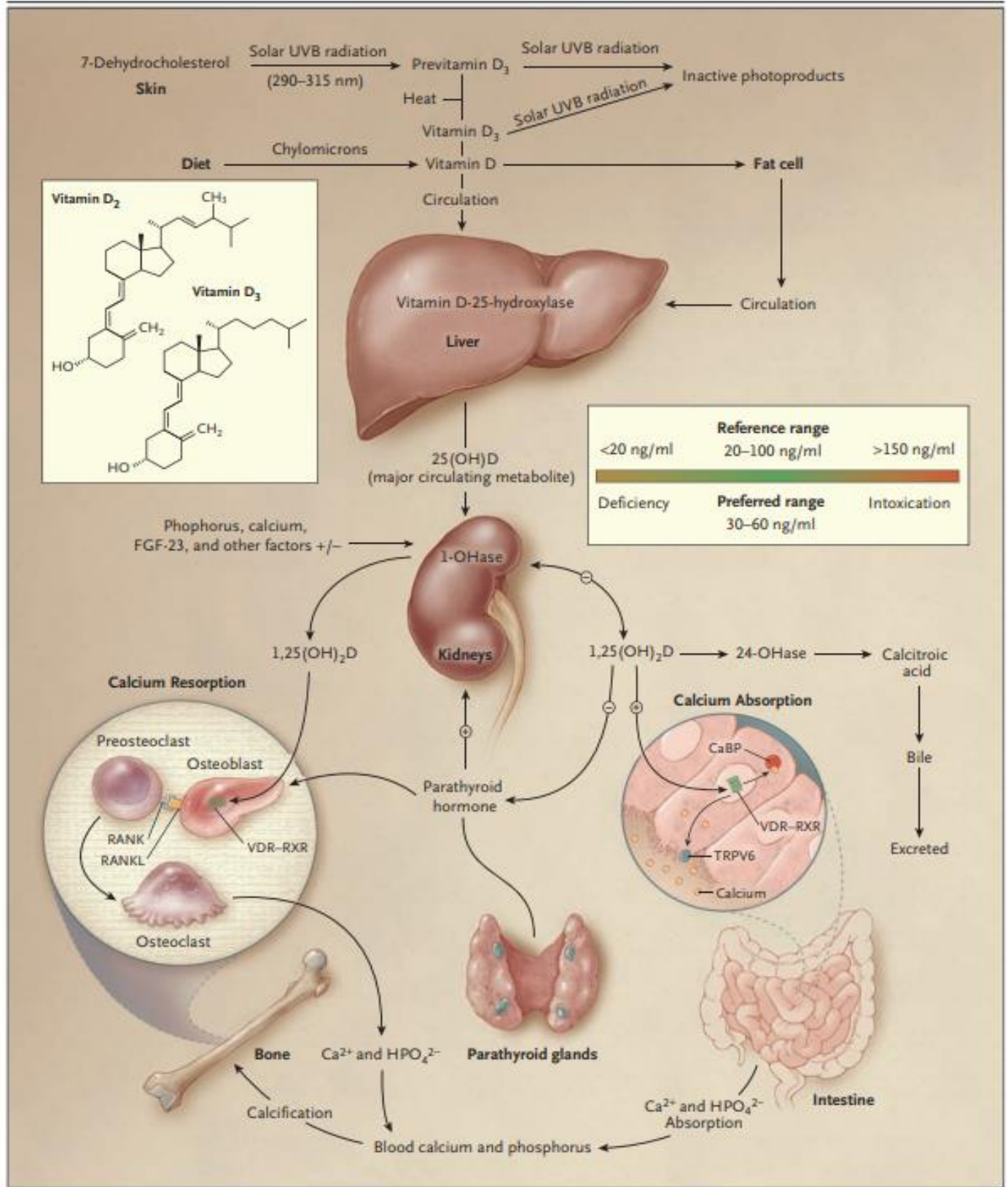
In adults, a long-term lack of vitamin D leads to the development of osteomalacia, osteoporosis, and muscle weakness. Recent studies have also established a connection between vitamin D insufficiency and an elevated risk of acquiring tuberculosis, otitis media, upper respiratory tract infections, influenza, and various other illnesses.



Signs and symptoms

- **Aching muscles:** They can be a sign of vitamin D deficiency because this nutrient is essential for keeping your muscles healthy. Without vitamin D, your muscles may become weak and achy.
- **Binge eating:** A sign of vitamin D deficiency is binge eating. Impaired satiety and the tendency to overeat are often seen in people who have low vitamin D levels.
- **Painful bones:** These can be a sign of vitamin D deficiency because vitamin D is essential for keeping your bones healthy. Without vitamin D, your bones may become weak and painful.
- **Fatigue:** It can be a sign of vitamin D deficiency because vitamin D is essential for cell metabolism. Without vitamin D, you may feel tired and run down all the time. This can make it difficult to get through your day-to-day activities.
- **Reduced endurance:** Without vitamin D, you may find it difficult to maintain your energy levels during physical activities. This can limit your ability to participate in physical activities and may lead to premature fatigue.
- **Low moods:** These may be a sign of vitamin D deficiency because vitamin D is essential for keeping your moods stable because it may have a role in neurotransmitter metabolism (especially serotonin). Without vitamin D, you may find it difficult to maintain your positive outlook on life and may experience frequent mood swings.
- **Problems sleeping well:** This can be a sign of low vitamin D levels for a few reasons. Vitamin D may influence the brain areas and neural paths that regulate the sleep-wake cycle.
- **Losing hair:** This can be a sign of vitamin D deficiency because this nutrient is essential for the follicular cycle in the hair. Without adequate vitamin D, the new hair does not emerge from the hair follicles.
- **Slow wound healing:** One potential sign that you may be deficient in vitamin D is that your wounds heal slowly. This is because vitamin D is essential for immune system
- **Dizziness:** This can be a sign of vitamin D deficiency because, in the absence of vitamin D, the bones become weak. A weak cervical spine can cause dizziness.

- Heart problems:** Low levels of vitamin D can lead to an increased risk of heart disease because this nutrient is essential for keeping your heart cells healthy, and without it, you may be at a greater risk of heart disease.



- **Weight gain:** This can be a sign of vitamin D deficiency because this nutrient is essential for keeping your metabolism stable. Without vitamin D, your metabolism may slow down, and you may find it difficult to lose weight.
- **Recurring infections:** These can be a sign of vitamin D deficiency because this nutrient is essential for keeping your immune system up to date. Vitamin D has a role in white blood cell metabolism.
- **Reduced cognitive function:** One potential sign that you may be deficient in vitamin D is that your cognitive function (memory) may be affected. This is because vitamin D is essential for keeping your brain healthy, and without it, you may find it difficult to think clearly or remember things. This can make it difficult to do everyday activities, such as driving or cooking.

Vitamin D deficiency in India is highly prevalent, and its diagnosis primarily relies on measuring serum 25hydroxyvitamin D [25(OH)D] levels, with consideration of demographic, dietary, and lifestyle factors.

Clinical and Radiological Considerations

- **Rickets in children:** Manifested as bone deformities, delayed closure of fontanelles, or growth retardation. Biochemical markers include low 25(OH)D combined with hypophosphatemia and elevated ALP.
- **Osteomalacia in adults:** Characterized by diffuse bone pain, muscle weakness, and fractures; confirmed by low 25(OH)D and radiographic evidence of bone demineralization.
- **DEXA scanning:** Used to assess bone mineral density (BMD). Correlation with 25(OH)D levels helps confirm chronic deficiency and evaluate risk of osteoporosis

Reasons for Vitamin D Deficiency

Limited Sunlight Exposure: Rising pollution levels block Ultraviolet B (UVB) rays, urbanization reduces direct sunlight due to densely packed buildings, and modern indoor lifestyles minimize sun exposure. Extreme weather conditions further discourage outdoor activities.

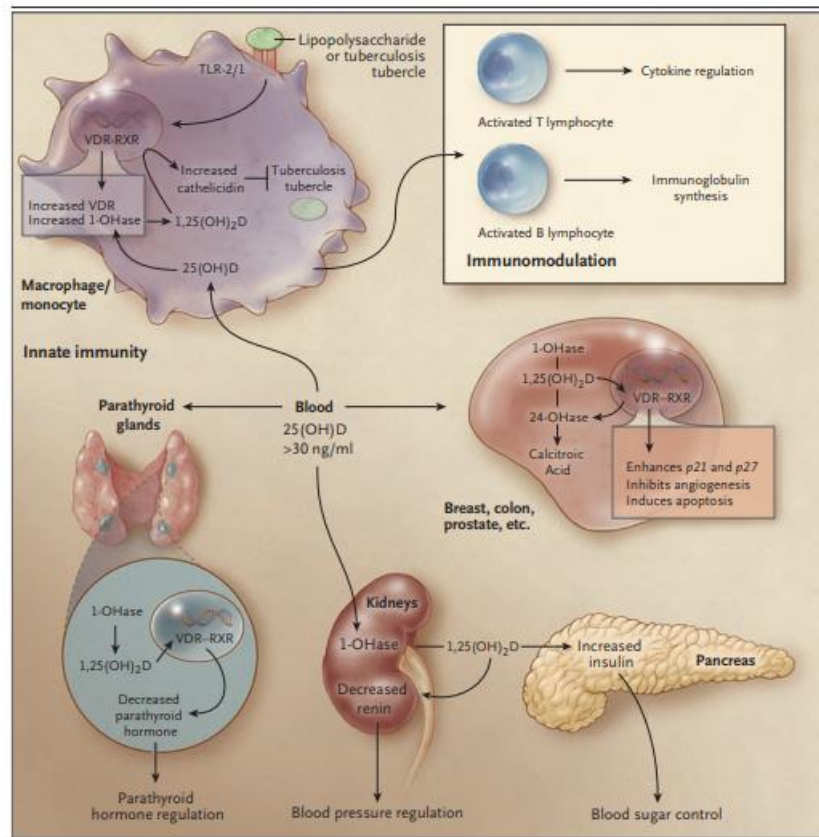
- **Diet:** Majority of the Vitamin D rich food are non vegetarian and 30 per cent of the Indian population follows a vegetarian diet, limiting the access to Vitamin D rich diet. Additionally, these foods are often expensive, making regular consumption difficult.

- Cultural and Social Practices: Covering the entire body due to cultural norms, especially among women, limit skin exposure to UVB rays. A preference for fair skin leads to sun avoidance through umbrellas, sunscreen, and staying indoors.

Latitude, Vitamin D deficiency and Chronic Diseases

Cancer

People living at higher latitudes face an increased risk of Hodgkin's lymphoma, along with colon, pancreatic, prostate, ovarian, and breast cancers. They also have a higher chance of dying from these cancers compared to those at lower latitudes. Both prospective and retrospective studies show that levels of 25-hydroxyvitamin D below 20 ng/mL are linked to a 30 to 50% higher risk of developing colon, prostate, and breast cancer, along with increased mortality rates.



An analysis from the Nurses' Health Study with 32,826 subjects found a negative relationship between colorectal cancer risk and median serum 25-hydroxyvitamin D levels. For example, at 16.2 ng/mL, the odds ratio was 1.0, while at 39.9 ng/mL, it dropped to 0.53. Serum 1,25-dihydroxyvitamin D levels showed no association with colorectal cancer. A prospective study of men indicated a direct relationship between vitamin D intake and colorectal cancer risk; the relative risk was 1.0 for an intake of 6 to 94 IU per day, and 0.53 for an intake of 233 to 652 IU per day.

Some commercial laboratories measure 25-hydroxyvitamin D₂ and 25-hydroxyvitamin D₃ with liquid chromatography and tandem mass spectroscopy and report the values separately. As long as the combined total is 30 ng per milliliter or more, the patient has sufficient vitamin D.^{7,14,27} The 1,25-dihydroxy vitamin D assay

should never be used for detecting vitamin D deficiency because levels will be normal or even elevated as a result of secondary hyperparathyroidism.

CONCLUSION

Undiagnosed vitamin D deficiency is quite common. The measurement of 25-hydroxyvitamin D serves as a key indicator of vitamin D levels. Serum 25-hydroxyvitamin D can predict bone health and is also linked to cancer risk and other chronic diseases. Reports indicate that postmenopausal women who increased their intake of vitamin D by 1100 IU saw a 60 to 77% drop in their risk of cancer. This highlights the importance of maintaining adequate vitamin D levels. Most commercial tests for 25-hydroxyvitamin D can effectively identify deficiency. Radioimmune assays measure total 25-hydroxyvitamin D, including both forms of 25-hydroxyvitamin D₂ and D₃. Some labs can measure these two forms separately. If the total level is 30 ng/mL or higher, vitamin D is considered sufficient. The 1,25-dihydroxyvitamin D test should not be used to check for deficiency since levels can be normal or even high due to secondary hyperparathyroidism. Since 25-hydroxyvitamin D tests can be costly and sometimes unavailable, providing children and adults with at least 800 IU of vitamin D₃ daily should ensure sufficient levels unless other issues arise. Much evidence suggests that the recommended intake should be increased to at least 800 IU per day. It's challenging to get enough vitamin D₃ from diet alone without consuming oily fish on a regular basis. Excessive sun exposure, especially to the point of burning, raises the risk of skin cancer. Therefore, sensible sun exposure or UVB use, along with supplements, is essential to meet the body's vitamin D needs.

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