

*Editorial*

**Vitamin D — The Sunshine Vitamin**



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Vitamins are substances those grow and develop normally in the body. Vitamin – D is a fat soluble Vitamin. There are two types of Vit – D in the body - Cholecalciferol – D3 and Ergocalciferol – D2. Cholecalciferol, also known as Vit D3 is a type of Vitamin D which in made by skin when exposed to sunlight; it is also found in some foods and are taken as dietary suppliment. Cholecalciferol in the skin following ultra violet light exposure, converted in the liver to calcifediol (25-hydroxy-vitamin D). Cholecalciferol was first described in 1936. It is on the world Health Organisation’s list of essential Medicines. It is a most effective and safe Medicine needed in a health system. The action of Calcitriol is mediated by the Vitamin D receptor, a nuclear receptor which regulates the synthesis of hundreds of protiens and is present virtually in every cell in the body.

The active UVB wave lengths are present in sunlight and sufficient amount of cholecalciferol can be produced with moderate exposure of the skin, depending on the strength of the sun. Time of day, seasons and altitude affect the strength of the sun, cloud cover or glass all reduces, the amount of UV exposure. Exposure of faces, arm, and legs averaging 15-30 minutes twice per week may be sufficient. But for darker skin, weaker sunlight more minutes of exposure are needed. Vitamin D overdose is impossible from UV exposure as the skin reaches the equilibrium where the vitamin degrades as fast as it created.

Cholecalciferol can be produced in skin from light emitted by the UV lamps in tanning beds, which produce ultraviolet primarily in the UVA spectrum, but typically produce 4% to 10% of the total UV emissions as UVB. Levels in the blood are higher in frequent uses of tanning salons.

Ergocalciferol, known as vitamin D2 and calciferol found in food and used as dietary suppliment to prevent and treat vitamin D deficiency. This includes vitamin D deficiency due to poor absorption by the intestines or liver diseases. It may also be used for low blood calcium due to hypoparathyroidism. It is used orally or by injection in the muscle. Ergocalciferol was first described in 1936 and is on the world health organisation list of essential Medicine, a most effective and safe medicine needed for health system.

Ergocalciferol are used as vitamin D supplement, where as cholecalciferol is produced naturally by skin when exposed to ultraviolet light. Ergometrol D2 and cholecalciferol (D3) are considered to be equivalent for vitamin D production, as both forms appear to have similar effecacy in ameliorating rickets and reducing incidence of fall in elderly. Conflicting reports exist concerning the relative effectiveness. Some studies suggest that ergocalciferol has less efficacy based on limitation of absorption, binding and inactivation, A meta analysis concluded that evidence usually favours cholecalciferol in raising vitamin D levels in blood, although it stated more research is needed.

Excessive doses of ergocalciferol result in increased urinary output, high blood pressure, kidney stone, kidney failure, weakness and constipation. When taken for a long time even tissue calcification very occur.

**Sources of Vitamin D : —**

Fifteen to thirty minutes of daily exposure to morning sunlight will help to produce vitamin – D by skin without sun screen.

Foods that provide vitamin D

- Fatty fish like tuna, mackrel and salmon.
- Beef liver.
- Cheese.
- Food fortified with vitamin – D like some dairy products, orange juice, soya milk, cereals.
- Egg yolks.
- Oysters.
- Cod liver oil
- Herring and sardines.
- Mushrooms.
- Meat
- Milk
- Oat meal
- Butter

**Crisis of vitamin D throughout world.**

More than 10 million cases of vitamin deficiency are counted in India every year. Several reviews have found high prevalence of vitamin D deficiency world wide, even in countries with low lattitude where it was generally assumed that UVB radiation was adequate enough to prevent Vitamin D deficiency, and in industrialized countries, where vitamin D fortification

has been implemented for years. Hence Vitamin D deficiency is a major public health problem world wide in all age groups. However most countries are still lacking data, particularly population representative data, with very limited information in infants, children, adolescent and pregnant women. In areas with available data, the prevalence of vitamin D deficiency / low vitamin – D status is a global problem in all age groups, particularly in girls and women from Middle East.

#### **Vitamin D deficiency : Common causes are : —**

- (1) Inadequate sunlight exposure (ultraviolet B rays.)
- (2) Inadequate nutritional intake of Vitamin – D.
- (3) Disorders limiting vitamin – D absorption.
- (4) Conditions impairing vitamin – D conversion into active reabolites – including certain liver and kidney diseases and hereditary disorders.

In between 1918 and 1920 Edward Malenby first stated role of diet in the development of ricket in children. In 1921 Elmar Maccollum identified certain antirachitic substance that could prevent rickets. Because the newly discovered substance was the forth vitamin identified it was called vitamin – D. The 1928 nobel prize in chemistry was awarded to Adolt Windaus, Who discovered 7 dehydrocholesteron the precursor of vitamin D.

Vitamin D deficiency is typically diagnosed by measuring the concentration of the 25 hydroxy vitamin in the blood, which is the most accurate measure of store of vitamin D in the body.

- Deficiency : <20ng/ml.
- Insufficient : 20-29 ng/ml.
- Normal : 30-100 ng/ml.

#### **Signs and symptoms : —**

Vitamin D deficiency can be asymptomatic. But it may cause several problems .

- Osteomalacia- a bone thinning disorder that occur exclusively in adults and characterised by proximal muscle wakness and bone fragility.
- Osteoporosis – a condition characterised by reduced bone mineral density and increased bone fragility.
- Increased risk of fracture.
- Rickets, a child hood disease characterised by impeded growth and deformity of the long bones. The earliest sign of subclinical vitamin D deficiency is craniotabes, abnormal softening and thinning of skul Bone.

- Muscle ache and weakness.
- Muscle twiching (faciulations) is commonly seen due to reduced ionised calcium from low vitamin D.
- Light headedness
- Periodontitis, local inflamatory bone loss that can result in tooth loss.
- Pre aclampsia : there has been a association of vitamin D deficiency in women who develop preacclampsia in pregnancy. Maternal vitamin D deficiency may affect the baby, causing overt bone disease from before birth and impairment bone quality after birth.
- Depression : Hypo-Vitaminosis – D is a risk factor for depression.
- Hypovitaminosis – D may worsen the cancer, but taking of vitamin – D suppliments has no significant effect on cancer risk. Hypovitaminosis D is thought to play a role in the pathogenesis of non alcoholic fatty liver diseases.
- It may play a role in immunity.

#### **Doses and administration : —**

The amount of vitamin D recommended is 400 I.U. per day for children, 600 I.U. per day for adults and 800 IU per day for people over age 70.

#### **Toxicity : —**

If vitamin D intake is excessive, blood calcium may reach levels that cause symptoms that are not only unpleasant but dangerous.

- Digestive distress, such as vomiting, constipation, stomach pain or diarrhoea, fatigue, digginess and confusion.
- Excessive thrust.
- Frequent urination.
- Pre mature birth.
- Darker skin pigmentation.
- Malabsorption.

Vitamin D is not actually a vitamin. It is a steroid hormone, which is made in the body under the right condition. However if the body does not make enough, it can also be obtained from food source. In U.S. 42% peoples are deficient of vitamin – D. In our country no such authentic report in found. However as found in some studies the presence of deficiency is much more and prevalent in both sexes of any age group.

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