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## Vitamin D: Hope of Women & Child Health

**V**itamin D is fat soluble vitamin but actually a hormone which is produced by skin, it is steroid prohormone and is produced endogenously in skin when ultra violet light of sun over wave length of 290-320 penetrates the uncovered skin. Vitamin D discovered more than 100 years ago but recently a lot of research is being conducted on this molecule and its role is emerging in various diseases. So it is coming up as newer therapy with newer concept.

Vitamin D sources are sun exposure, certain food products like Fatty fish, egg yolk, cheese, fish liver oil, some mushrooms and nutrient supplement. Fortified food like milk, yoghurt, orange juice are rich sources of Vitamin D.

There are two forms of dietary Vitamin D. Vitamin D3 & D2 D3-Cholecalciferol & D2 Ergocalciferol. Supplements are biologically inert. They are converted into 25 hydroxy vitamin D (25(OH)D) Calcidiol in liver which is further metabolized in kidneys to physiologically active form 1, 25-dehydroxy Vitamin D (1,25(OH)2D), Calcitriol. Now extrarenal metabolism has been demonstrated in every organ system. During pregnancy placenta is the most prominent site for extrarenal activation of Vitamin D.

25(OH)D is biomarker of exposure and its half life is 15 days, it is best indicator for Vitamin D status in body but it does not reflect Vitamin D stores in body. Half life of 1, 25 (OH)2 D is only 15 hours so it is not an indicator of Vitamin D levels.

Traditional role of Vitamin D is to promote Calcium absorption and enable normal mineralization of bones and maintain bone health. It also prevent hypocalcemic tetany. Other roles are emerging as modulation of cell growth, neuromuscular system and immune function. These roles are taking new dimensions in women health and during pregnancy also. It has now preventive a therapeutic role, in other conditions like multiple sclerosis, rheumatoid, asthmatic, cardiovascular disease, hypertension, diabetes, obesity, skin problems like psoriasis and psychiatric disease like depression. Low Vitamin D levels are also been linked to breast cancer, colon cancer, ovarian cancer.

Deficiency in early pregnancy is associated with low birth weight baby but whether supplement during pregnancy can prevent this, is not known. Vitamin D deficiency has been co-related to complication like preeclampsia, preterm labour. Low level of Vitamin D in pregnancy <50 nmol/L may lead to 5 fold increased risk of preeclampsia.

Recently it is also co-related to Glucose intolerance and so Vitamin D deficiency may be correlated to increased risk of glucose intolerance. Whether deficiency as a cause of GDM is conflicting. Deficiency of Vitamin D during pregnancy can effect fetal bone development, fetal lung development & neonatal immune condition and may lead to childhood asthma, It is also a major cause of neonatal seizures.

### Vitamin D Deficiency

Deficiency of Vitamin D is at level  $<30$  nmol/L ( $<12$  ng/ml). At levels of 30-50 nmol/L (12-20 ng/ml), there is potential risk of Vitamin D deficiency.

Serum concentration of 25(OH)D<sub>3</sub> are optimum at 75 nmol/L (3ng/ml). Vitamin D toxicity can be there where levels are  $\geq 374$  nmol/L ( $\geq 150$  ng/ml).

#### *Recommended Daily Allowance*

upto 1 year 400 IU (10mcg)/day

after 1 year 600 IU (15mcg)/day

Vitamin D  $>2000$  IU/day is considered potentially unsafe even for non pregnant woman. In pregnancy, higher levels can cause birth defects. Half hour of sun exposure delivers 50,000 IU of Vitamin D. Limitation of sun exposure is must as it may be carcinogenic is largely responsible for aging and cosmetic changes. Melanin absorbs UVB of sunlight and diminishes cholecalciferol by 90%.

Until recently it was thought that Vitamin D deficiency is more commonly seen in high risk women like darker pigmentation, limited access to sunlight, covered with clothes, too much use of sunscreen. But deficiency is quite high even in low risk women. Over all it is estimated that 50% women may be Vitamin D deficient. But there is no data to support routine screening of women before or during pregnant. As test is expensive and not cost effective. If pregnant woman is deficient Vitamin D upto 1000 IU can be offered. Transplacental passage of maternal Vitamin D is the sole source of Vitamin D for fetus so infant born to Vitamin D deficient mother can be Vitamin D deficient.

Vitamin D deficiency is not yet widely recognized. Awareness is required among doctors and patients for this problem. It is easily treatable condition and can help a long way to prevent many health hazards in women and future offspring. Adequate Vitamin D supplement can be a hope to boost the current and future health.