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RESEARCH ARTICLE

IMPACT OF VITAMIN D DEFICIENCY DURING PREGNANCY

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Abstract

Vitamin D deficiency (vdd) is a public health problem. 50% of the world population have inadequate levels of vitamin D. Vitamin D is necessary for the absorption and metabolism of calcium and phosphorus. More than 90% of pregnant women had vitamin D insufficiency. According to the vitamin D council, pregnancy is a known risk factor for vitamin D deficiency. Vitamin D deficiency during pregnancy increases the risk of pre-eclampsia, gestational diabetes, preterm birth, and low birthweight. Pregnant mothers who are deficient in vitamin D should be treated with cholecalciferol or ergocalciferol. Supplementing pregnant women with vitamin D reduces the risk of pre-eclampsia, gestational diabetes, low birthweight and the risk of severe postpartum haemorrhage.

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Introduction:-

In many countries Vitamin D deficiency (vdd) is a public health problem. 50% of the world population have inadequate levels of vitamin D. Vitamin D is a fat-soluble vitamin that plays an important role in calcium homeostasis and bone metabolism. Pregnancy is a time of tremendous growth and physiological changes for mother and her developing fetus. 20- 40% of pregnant women have been identified as a high-risk group. However, according to the vitamin D council, pregnancy is a known risk factor for vitamin D deficiency.

Vitamin D consists of 2 bioequivalent forms. Vitamin D₂ (ergocalciferol), is obtained from dietary vegetable sources and oral supplements. Vitamin D₃ (cholecalciferol), is obtained from skin exposure to ultraviolet B (UVB) radiation in sunlight, ingestion of food sources such as oily fish, fortified foods (milk, juices, margarines, yogurts, cereals, and soy), and oral supplements.

Vitamin D₂ is synthesized by the ultraviolet irradiation of 7-dehydrocholesterol. Vitamin D is metabolized in the liver to 25-hydroxy vitamin D [25(OH) D], which is metabolized in the kidneys through the enzyme 25-hydroxy vitamin D-1 α -hydroxylase to 1, 25-dihydroxyvitamin D (the biologically active form). The renal production of 1, 25-dihydroxy vitamin D is regulated by the parathyroid hormone, serum calcium, and phosphorus levels.

Epidemiology

About 1 billion people worldwide have vitamin D deficiency, while 50% of the population has vitamin D insufficiency. More than 90% of pregnant women had vitamin D insufficiency. 96.1% of pregnant women had levels of vitamin D under 20 ng/ml; 88.7% levels of vitamin D under 12 ng/ml, and a severe deficiency under 5 ng/ml in 27.1% of the women.

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Risk factors of Vitamin D deficiency

Any factor that affects the transmission of UVB radiation or interferes with its skin penetration will determine the reduction of 25(OH)D.

Among these the risk factors are

Lack of exposure to sunlight

Use of sunscreen protection factor 30 reduces the synthesis of Vitamin D

Less intake of Vitamin D foods

Darker skin need sun exposure 3-5 times more to synthesize the same amount of Vitamin D than individuals with lighter skin

Aging decrease the capacity of the skin to produce Vitamin D

Season and the time of the day influence skin production of Vitamin D

Obesity- Vitamin D is sequestered by body fat

Drugs like anticonvulsants, glucocorticoids can lead to Vitamin D Deficiency

Impact of vitamin D deficiency

In mother

Affect the bone of both mother and child

Preeclampsia

Gestational Diabetes

Bacterial Vaginosis

Preterm Delivery

Cesarean Section

Osteomalacia

In child

Neonatal Hypoglycemia and Hyperinsulinemia

Low birth weight, height, and head circumference of the offspring

Asthma and Chronic Obstructive Pulmonary Disease

Hypocalcaemic tetany

Rickets in childhood

Vitamin D supplementation

Daily vitamin D supplementation with oral cholecalciferol or ergocalciferol is safe in pregnancy.10 micrograms (400 units) of vitamin D per day is recommended for all pregnant women. High-risk women are advised to take at least 1000 units per day. Women at high risk of pre-eclampsia are advised to take at least 800 units per day combined with calcium.

Treatment

For majority of women who are deficient in vitamin D should be treated for 4–6 weeks, either with cholecalciferol 20 000 iu a week or ergocalciferol 10 000 iu twice a week, followed by standard supplementation, is appropriate. Women who require short-term repletion, 20 000 iu weekly appears to be an effective and safe treatment of vitamin D deficiency.

Conclusion:-

vitamin D deficiency is very common in all age groups. People with vitamin D deficiency are continuously increasing. Prevalence of vitamin D deficiency in the general population and in women of child-bearing age is high. Vitamin D deficiency is known to be associated with an increased prevalence of preeclampsia, which a common cause of increased mortality rates in pregnancy.

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