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Original Research Article

Prevalence of Vitamin D Deficiency and Its Seasonal Variation among Pregnant Female of Jammu Region

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ABSTRACT

The deficiency of vitamin D is prevalent in India to the extent that it is almost reaching up to an epidemic. In a population where the deficiency of vitamin D already prevails, together with low dietary intake of calcium, there is worsening of the situation during pregnancy as calcium is needed by the developing fetus. Globally, it was reported that the prevalence of Vitamin D deficiency during pregnancy to be in range of 18-84%, depending upon the country and its social and cultural practices, clothing etc. The Endocrine society of India also recommends screening of people at risk including pregnant & lactating women. Keeping these things in mind, the present study was conducted with the aim to estimate the levels of vitamin D in 100 pregnant women and its seasonal variation. It was observed that majority of the pregnant females present with vitamin D deficiency and only a few pregnant females have sufficient vitamin D levels. Also, the deficiency was more during the winter season as compared to the summer season. Thus, there is a need for early detection of hypovitaminosis D during pregnancy and its supplementation along with intake of foods fortified with vitamin D.

Keywords: Vitamin D, deficiency, pregnancy, seasonal variation.

INTRODUCTION

Vitamin D deficiency is prevalent in India to the extent that it is almost reaching up to the extent of an epidemic. In a population where already deficiency of Vitamin D prevails and coupled with poor intake of calcium in the diet, the problem worsens during pregnancy because calcium is needed by the developing fetus. [1] Many studies have shown prevalence of Vitamin D deficiency during pregnancy to be in range of 18-84% globally, depending upon the country and its social and cultural practices, clothing, physical activity etc. [2,3] The Endocrine society of India also recommends screening of people at risk including pregnant & lactating women. [4] Newly married females are victims to Vitamin D deficiency due to the fact that they are discouraged for outdoor activities and have to cover themselves fully due to the ethnic reasons. [2]

The prevalence of Vitamin D deficiency during pregnancy is associated with increased risk of problems among mothers like osteomalacia, pre-eclampsia, gestational diabetes and preterm deliveries [5,6] along with bad impact as the new borne babies including hypovitaminosis D, infantile rickets etc. [1]

Keeping in view, the high incidence of vitamin D deficiency in Jammu region,

the present study was conducted among pregnant females so that the need for supplementation of vitamin D during pregnancy is emphasized for the better maternal and infant health.

MATERIALS AND METHODS

The study was conducted in the Department of Biochemistry, SMGS Hospital, Jammu, in which 100 pregnant females in the age group of 20-40 years were included in the study and those with any pre-existing medical disorders and twin pregnancy were excluded from the study. A 25(OH)D level <20ng/mL was considered as deficiency, 21-29 ng/mL as vitamin D insufficiency, and ≥ 30ng/mL as vitamin D sufficiency. The normal level of 25-hydroxycholecalciferol is more than 30 ng/ml. Serum obtained from 3 ml of blood drawn from the ante-cubital vein under aseptic conditions used for the estimation of the vitamin D levels. Vitamin D levels were estimated in Abbott architect chemilumi-nescent microparticle immunoassay. [7]

RESULTS

It was observed in our study that the mean serum vitamin D concentration of 100 pregnant women enrolled in the study was 13.45ng/ml. Vitamin D deficiency was present in 73% and insufficiency in 24% pregnant women. Only 3% of pregnant women had vitamin D sufficiency (>30 ng/ml). Mean serum vitamin D concentrations were significantly ($p<0.0001$) lower from October to March as compared from April to September in pregnant women.

Table 1: Comparison of seasonal mean serum 25(OH)D concentration levels of pregnant women

Variables	Serum 25(OH)D concentration (ng/ml) Mean ± standard deviation	Statistical inference (Unpaired 't' test)
October to March (n=29)	6.44 ± 3.03	$t = 9.77$; $p < 0.0001^{**}$
April to September (n=21)	18.36 ± 5.53	

*Not significant; **Significant

Table 2: Distribution of children according to serum 25(OH)D concentration

	Deficiency	Insufficiency	Sufficiency
October to March (n=56)	41 (56.2%)	14 (58.3%)	1 (33.3%)
April to September (n=44)	32 (43.8%)	10 (41.7%)	2 (66.7%)
Total	73 (100%)	24 (100%)	3 (100%)

DISCUSSION

In our study it was observed that only 3% of women had vitamin D sufficiency whereas the majority of the pregnant women present with deficient vitamin D levels. Also during pregnancy, there are more requirements of dietary calcium and Vitamin D. In many studies, it has been proposed that $1,25(OH)_2D$ causes release of calcium and also has an impact on release of placental hormones. Calcium has a role in maintaining implantation, normal antenatal course and is required for growth of fetus. The active form of Vitamin D_3 ($24,25(OH)_2D$) is synthesized by the placenta and has a role in mineralization of fetal skeleton. [8] Similar to our study, Sahu et al reported 74% of mothers with vitamin D deficiency. [9]

Among pregnant female, mean serum 25 (OH)D concentration from October to March (6.44 ng/ml) was significantly lower ($p<0.0001$) as compared to that from April to September (18.36 ng/ml) in our study. Marwaha et al, also recorded significantly lower values of 25(OH)D in winter as compared to summer period [10] In the study conducted by Harinarayan CV on maternal vitamin D status in pregnant women in South India, 60% of women had low vitamin D level (<50nmol/L) at 30 weeks of gestation. [11] It is important to have adequate levels of vitamin D in the diet which is crucial for proper health of the mother and fetus.

Vitamin D deficiency during pregnancy is also associated with complications like pre-eclampsia,

gestational diabetes mellitus and increased risk of caesarean section delivery. [12] Along with that there is increased risk of osteomalacia which has bad impact on maternal health during her reproductive years. [13] Studies have shown that in Indian scenario, poor maternal nutrition and early pregnancy are contributing factors for hypovitaminosis D along with inadequate exposure to sunlight. [14] Vitamin D supplementation should be emphasized in women during early pregnancy. The National Institute for health and care excellence remarks that pregnant women should be informed about the importance of adequate vitamin D and the need for its supplementation during pregnancy which will lead to good health later on. The Endocrine society also emphasizes the need for Vitamin D supplementation to maintain the levels above 30ng/ml and to meet the increasing demands of pregnancy and lactation.

CONCLUSION

Thus, there is a need for early detection of hypovitaminosis D during pregnancy and its connection with Vitamin D supplementation along with intake of foods fortified with Vitamin D and adequate exposure in sunlight.

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