

VITAMIN D STATUS IN PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT OUR TERTIARY CARE CENTRE

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ABSTRACT

Introduction

Vitamin D (VD) is a component of the intricate steroid hormone system, which has long been linked to the metabolism of bone. The rise in rickets cases recently has renewed attention in vitamin D deficiency (VDD). Furthermore, research on the physiology of VD raises the possibility that the consequences of VDD may extend far beyond rickets and include problems with pregnancy, allergies, diabetes, cancer, and cardiovascular disease. Serum levels of 1,25(OH)D can increase up to threefold during pregnancy, peaking in the third trimester and beginning at 10–12 weeks of gestation

Aim and Objectives

This prospective study is undertaken to study vitamin D levels in pregnant women attending the antenatal clinic of our tertiary care hospital.

Methodology

In total, 200 pregnant women with singleton pregnancy, <16 weeks of gestational age, visited to antenatal clinic of our institute were consecutively enrolled for the study. 3 ml venous blood sample was collected the sample was centrifuged for the separation of serum, used for the estimation of vitamin D by using chemiluminescence immunoassay in the department of Biochemistry.

Results and Discussion

In the present study, 200 pregnant women who were attending the antenatal clinic for routine checkup were screened for Vitamin D levels. The mean age of the pregnant women were 24.78±8.64 years. It is found that the mean levels of vitamin D in vitamin D insufficient groups were 23.162±1.68 and in deficient were 13.23±5.432. Out of the 200 pregnant women, 36 (18%) had insufficient vitamin D levels and 150 (75%) had vitamin D deficiency. The prevalence of VDD was found to be 75% in pregnant women in our region.

Conclusion

Vitamin D deficiency is very common in pregnant women, hence the present study recommends routine screening of vitamin D deficiency in pregnant women.

Key-words: vitamin D deficiency, insufficiency and pregnant women.

INTRODUCTION

Vitamin D (VD) is a component of the intricate steroid hormone system, which has long been linked to the metabolism of bone. The rise in rickets cases recently has renewed attention in vitamin D deficiency (VDD). Furthermore, research on the physiology of VD raises the possibility that the consequences of VDD may extend far beyond rickets and include problems with pregnancy, allergies, diabetes, cancer, and cardiovascular disease. Serum levels of 1,25(OH)D can increase up to threefold during pregnancy, peaking in the third trimester and beginning at 10–12 weeks of gestation.[1]

Pregnant women probably have higher cellular exposure to VD throughout the second and third trimesters due to an increase in the active form of the vitamin, which suggests a function for VD in obstetrics well-being. Low birth weight, preterm delivery, cesarean section, gestational diabetes mellitus, and VDD preeclampsia are associated with worse perinatal outcomes.[2,3,4,5] VD has a variety of impacts during pregnancy, including those on the inflammatory response and placental function.[6] There has been evidence of a rise in proinflammatory cytokines, including interleukin-6, interferon-gamma, and tumor necrosis factor- α , in pregnancies with VDD.[7] Important immuno-modulated properties like VD may aid in establishing a healthy immune response from the mother to the placenta.[8]

India being a tropical country with ample sunlight throughout the year, people still suffering from VDD and it will worsen in pregnancy. Data regarding the prevalence of hypovitaminosis in pregnancy are scanty especially in north eastern part of India. This prospective study was undertaken to study vitamin D levels in pregnant women attending the antenatal clinic of our tertiary care hospital.

AIM & OBJECTIVES

This prospective study was undertaken to study vitamin D levels in pregnant women attending the antenatal clinic of our tertiary care hospital.

METHODOLOGY

Study design and settings

This prospective study was done to determine vitamin D levels in pregnant women attending the antenatal clinic of Department of OBG at our tertiary care hospital.

Sampling method

Complete enumeration

Inclusion criteria

In total, 200 pregnant women with singleton pregnancy, <16 weeks of gestational age, visited to antenatal clinic of our institute were consecutively enrolled for the study. Gestational age of the subject was determined using definite menstrual history and or first trimester ultrasonographic scan. Written informed consent was taken from the recruited subjects.

Exclusion criteria

Pregnant patient with >16 weeks, known history or evidence of medical disorder such as thyroid, parathyroid, or adrenal, collagen disorder, hepatic or renal dysfunction, metabolic bone disease, type 1 diabetes mellitus, and malabsorption were excluded. Women were also

excluded if they had history of medication with drugs interfering with calcium and VD metabolism like anticonvulsants, corticosteroids, thiazides, and not willing to participate in the study.

Sample collection and analysis

3 ml venous blood sample was collected the sample was centrifuged for the separation of serum, used for the estimation of vitamin D by using chemiluminescence immunoassay in the department of Biochemistry.

Statistical analysis

Descriptive statistics was used to calculate the mean \pm SD. *t*-test unequal variance was performed to compare the mean value between the groups. All *P* value <0.05 within 95% confidence interval and at 5% level of significance were considered to be statistically significant.

RESULTS

In the present study, a total of 200 pregnant women were enrolled as per inclusion and exclusion criteria during the study period.

Table 1: Demographic profile of study subjects (no=200)	
Mean age	24.78 \pm 8.64
Mean parity	2.12 \pm 1.6

Table 2: Vitamin D levels in study subjects	
Vitamin D insufficient group	23.162 \pm 1.68
Vitamin D deficient group	13.23 \pm 5.432

Table 3: Frequency of distribution of Vitamin D levels in study subjects			
Vitamin D status	Mean values	No (%)	Percentage
Vitamin D insufficient group	23.162 \pm 1.68	36	18%
Vitamin D deficient group	13.23 \pm 5.432	150	75%

DISCUSSION

In the present study, 200 pregnant women who were attending the antenatal clinic for routine checkup were screened for Vitamin D levels. The mean age of the pregnant women were 24.78 \pm 8.64 years. It is found that the mean levels of vitamin D in vitamin D insufficient groups were 23.162 \pm 1.68 and in deficient were 13.23 \pm 5.432. Out of the 200 pregnant women, 36 (18%) had insufficient vitamin D levels and 150 (75%) had vitamin D deficiency. The prevalence of VDD was found to be 75% in pregnant women in our region.

Despite of the fact that India is a vast tropical country extending from 8.4°N latitude to 37.6°N latitude where ample of sunlight is available throughout the year, nearly 42 % of the pregnant women in northern India were deficient of 25(OH)D concentrations <10 ng/ml [9]. In the present study, the prevalence of VDD during pregnancy has been found to be 93.5 % (391/418) which is a matter of great concern. Mostly, pregnant women 59 % (247/418) had insufficient levels of vitamin D which reflects that they may develop severe deficiency of

vitamin D if not treated. Maternal age has no association with vitamin D levels. Few prevalence studies reported that VDD is high in Europe, and pregnant women are at high risk of developing VDD [10,11] whereas it is relatively less common in USA and Canada as milk is usually fortified with vitamin D and use of vitamin supplements is common [12]. Previous studies from southern and northern part of India had reported that 61 and 96.3 % of the pregnant women had VDD, respectively [13,14]. Serum 25(OH) levels were significantly lower in winter in the second and third trimester. Recently, Dasgupta et al. from North-Eastern part of India reported that 42 % of pregnant women were found to have VDD and 14 % of them had insufficient vitamin D levels which are quite less compared with present study where 93.5 % of pregnant women had VDD and 59 % had insufficient vitamin D levels. Variation in deficiency of vitamin D levels during pregnancy has been observed from different parts of the country. One earlier study done by Sachan et al. observed that 84 % of pregnant women were deficient of vitamin D taking the cut-off of 22.5 ng/ml and serum mean 25(OH) level of 14 ± 9.3 ng/ml which is comparable with mean serum 25(OH) level of 15.41 ± 8.97 ng/ml in the present study population. Recently, a study by Fariba et al. 2013 demonstrated that vitamin D insufficiency is associated with an increased risk of gestational diabetes, pre-eclampsia, and small for gestational age infants.

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CONCLUSION

Vitamin D deficiency is very common in pregnant women, hence the present study recommends routine screening of vitamin D deficiency in pregnant women.

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