

Deficiency of Vitamin D Levels in First Trimester of Pregnancy among Primigravida Women

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ABSTRACT

Aim: To determine the prevalence of deficiency of vitamin D levels in first trimester of pregnancy among primigravida women.

Study design: Prospective, cross-sectional study

Place and duration of study: Department of Obstetrics & Gynaecology, Shaikh Zayed Hospital, Lahore from 1st January 2020 to 30th June 2020.

Methodology: Eighty primigravida women in their first trimester of pregnancy were included. Patients detailed demographics body mass index were recorded after taking written consent and aged between 18-45 years of age. Women in their first trimester of pregnancy were presented in this study. Serum 25-hydroxy vitamin D3 [25 (OH) D3] levels were observed by taking blood samples from all patients.

Results: Mean age of the patients was 23.8±4.7 years with mean body mass index 20.08±2.91 kg/m². The deficiency in serum vitamin D level (25 (OH) D3 <30 ng/mL) was found among 72 (90%) patients and only 8 (10%) women were found sufficient serum vitamin D level. Among 72 deficient women, 11 (13.75%) women were severely deficient (<10 ng/ml), 15 (18.75%) women were deficient (10-<20 ng/ml) and 46 (57.5%) women were insufficient (20-<30 ng/ml). Mean serum level of vitamin D deficiency was 14.1±2.34.

Conclusion: The prevalence of deficiency of vitamin D levels in first trimester of pregnancy among primigravida women was significantly high.

Keywords: First trimester, Primigravida, Vitamin D, Pregnancy

INTRODUCTION

Vitamin D deficiency has almost been a constant epidemic in recent times. The problem does not impact only developed countries but it has also become an immense problem in developing countries.^{1,2} If there are issues that are so common among men and women, why do we not have a pregnant concern of population? It's a problem of about a milliard of people worldwide, according to an estimate. Especially in Pakistan, where we do not understand the state of the art or specific preventive or surveillance plan during pregnancy.

Vitamin D has its place in calcium metabolism and is a fat soluble vitamin. It is metabolized by the specially measured liver into 25-hydroxy vitamin D3 [25(OH) D3]. Collectively, the serum calculation reflects vitamin D achieved from exposure to sun and diet. Serum level is required at 30ng/ml (75 nM/L), but the bone issue can only be prevented at 20 ng/ml³. These normal parameters should be alerted to a non-pregnant population, and the normal pregnancy conditions must also be established.⁴

The function of vitamin D has to do not only with the integrity of bones, but with preeclampsia, pregnancy and other adverse results⁵, it has also been found that in the mother hypovitaminosis D of the newborns, low vitamin D levels have been observed in the cord blood. The long-term neonatal storehouses of Vitamin D also rely on their foetal

levels. Thus we stop hypovitaminosis in the neonate at birth and childhood by controlling the mother's vitamin D. For the maternal preservation, as well as for the formation and development of foetal skeletons and chronic disease after birth and in later life, short vitamin D is required⁶.

Serum vitamin D levels in general depend on your diet, sun exposure, and skin content of clothing and melanin. However, is sun exposure and the normal 200 IU intake adequate to satisfy increasing pregnancy requirements? In recent decades⁸ both in Western countries and in countries like Saudi Arabia, Iran and India, in which women wear covered clothes. The causes of the deficiency can variable however from place to place.⁷ The figures were higher than anticipated. The conditions worsened in winter particularly when outdoor activities were scarce were found⁹.

The women in Pakistan are little aware about this. The culture of men and women must be fully clothed, and the heads, hands and feet are regularly uncovered. Women have built knowledge in Pakistani urban environments to use sun blocks and to prevent direct sunlight exposure. These interventions help prevent tanning of the skin as the beauty mark of our society is a fair skin. With regard to pregnancy, there are a minimum of vitamin D in the multi-vitamin supplements used during pregnancy (5-12.5 micrograms/d). In addition, vitamin D is not fortified in routine food, flour or dairy products. Other qualitative factors may be a regional factor, education level, exercise levels, parity, socioeconomic status, smoking, maternal BMI and gestation era¹⁰.

Received on 13-10-2020

Accepted on 28-12-2020

MATERIALS AND METHODS

This prospective cross-sectional study was conducted at Department of Obstetrics & Gynaecology, Shaikh Zayed Hospital Lahore from 1st January 2020 to 30th June 2020 and comprised of 80 patients. Patients detailed demographics body mass index, was recorded after taking written consent and age between 18-45 years. Patients with medical illness, diabetes, hypertension, tuberculosis cardiac illness and those were not agreed were excluded. Women in their first trimester of pregnancy were presented in this study. Serum 25-hydroxy vitamin D3 [25 (OH) D3] levels were observed by taking blood samples from all patients. LMP measured gestational age and obstetric ultrasonography confirmed it. Information was registered, such as age, educational level, gestational age, parity, income monthly, smoking and exposure daily to the sun or use of multivitamins. Complete data was analyzed by SPSS 22.

RESULTS

Mean age of the patients were 23.8±4.7 years with mean BMI 20.08±2.91 kg/m². Out of 80 primigravidas women in their first trimester of pregnancy, deficiency in serum vitamin D level (25 (OH) D3 <30ng/mL) was found among 72 (90%) patients and only 8 (10%) women were found sufficient serum vitamin D level (Table 1).

Among 72 cases of deficient pregnant women, frequency of severely deficient (<10ng/ml) women were 11(13.75%), deficient women (10-<20ng/ml) were 15(18.75%) and insufficient women (20-<30 ng/ml) were 46 (57.5%). Mean serum level of vitamin D deficiency was 14.1±2.34 (Table 2)

Table 1: Baseline detailed demographics of the women (n=80)

Variable	No.	%
Mean age (years)	23.8±4.7	
Mean BMI (kg/m ²)	20.08±2.91	
Prevalence of vitamin D	72	90.0
Non-prevalence (sufficient)	8	10.0

Table 2: Distribution of cases according to vitamin D serum level (n=80)

Variable	No.	%
Mean serum level	14.1±2.34	
25(OH)D levels		
Sufficient (30ng/ml)	8	10
Insufficient (20-<30ng/ml)	46	57.5
Mild deficient(10-<20ng/ml)	15	18.75
Severe deficient(<10ng/ml)	11	13.75

DISCUSSION

Deficiency in vitamin D during pregnancy is very common. Our study found that the prevalence of vitamin D deficiency was (90 %) comparable to that observed in Khurshid et al¹¹ and Pehlivan et al¹², while South Carolina study reported 41% of pregnant females with deficiency of vitamin D.¹³ The study also found that in 62% Caucasian pregnant women and 96% in African American pregnant women had deficiencies in vitamin D.^{13,14}

This study indicates a statistically significant correlation between women with vitamin D deficiency and

housewives (90%), who had insufficient sunlight exposure (85%), no vitamin D deficiency supplementation (90%), aged between 18-45 years, living in urban areas (81%) and multiparous women (70%). These results are comparable with a study done by Prasad et al.¹⁵ They did not find any correlation between the number of pregnancies and vitamin D deficiency, however. The risk of vitamin D deficiency in housewives who tended to live indoors was higher and direct sunlight exposure was decreased. The shortcoming is that the exposure based on sunlight still has a bias for religion. The burqa practice is more vulnerable to vitamin D deficiency in the Muslim culture. A significant factor affecting the status of vitamin D is likely to be sunlight exposure at different latitudes. The results of previous studies of vitamin D status among pregnant women in Asia at variable latitudes and in other regions near 36°N¹⁶⁻¹⁸ which is similar to the latitude of the this study.

In the present study, the fact that educated working women were less likely to have vitamin D deficiency compared to uneducated women or housewives was taken into account by socio-demographic factors. It has had its own impact on lifestyle and socioeconomic status. Pregnancy itself requires higher vitamin D levels. And all pregnant women appear to be at risk for vitamin D deficiency.¹⁹ The deficiency is usually due to insufficient food consumption or inadequate exposure to the sun. There is no screening protocol for the amount of vitamin D in standard treatment during the prenatal period. No wonder the studies of South Asia's sun-enriched countries also have remarkable data during pregnancy on vitamin D deficiency.²⁰ Because knowledge and prompt response can easily adjust the risk factors, pregnant women can be encouraged to carefully monitor their intake of vitamin D and to make easy changes to their lifestyle.²¹

The distinctive feature of our research is that with no known medical disease or concurrent drug treatment, we enrolled young and healthy primigravidas. But the drawback of our studies is that we have not observed the full duration of pregnancy, which might have helped to predict levels of cord blood in delivery. In recent years, the possible effect of vitamin D deficiency during pregnancy on maternal and neonatal health has attracted a lot of interest. However, using Hill's criteria, a causal relation between vitamin D deficiency during pregnancy and adverse pregnancy-related results remains to be determined.

CONCLUSION

The prevalence of deficiency of vitamin D levels in first trimester of pregnancy among primigravida women was significantly high.

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