ORIGINAL ARTICLE

Vitamin D Deficiency during Pregnancy in Primigravida Females

SALMA ZAMAN[1], FARRUKH BASHIR[2], MUNAWAR AFZAL[3]

ABSTRACT

Aim: To determine the frequency of vitamin D deficiency during pregnancy in primigravida females
Place of Study: Department of Obstetrics and Gynaecololgy, Lady Willingdon Hospital, Lahore
Methods: A total of 100 primigravida pregnant women with singleton pregnancy between 18-35 years of age with more than 10 weeks of gestation were included in the study while those cases who were having history of vitamin D deficiency were excluded from the study. The study was conducted between September 2013 to March 2014. A 5 cc blood sample was obtained with the help of paramedical staff and sent to the pathology lab for evaluation of 25 hydroxy vitamin-D levels and all the reports were reviewed, in our study we considered vitamin D deficiency as <20ng/ml levels of 25 OHvit-D3.
Results: Mean age of the patients was recorded as 25.29±7.64 years. Frequency of vitamin D deficiency was recorded in 78% of the cases.
Conclusion: We concluded that the frequency of vitamin D deficiency is higher among pregnant women with primigravida.
Keywords: Pregnant women, primigravida, vitamin D deficiency

INTRODUCTION

Vitamin D deficiency is the widely reported nutritional deficiency and affecting the global population[1]. It is found to be associated with poor bone development and identified as the cause of rickets[2]. It is involved in the cell proliferation and differentiation, while its deficiency is implicated as a causative factor in various metabolic, autoimmune, and neoplastic disorders. The role of vitamin D is established in the glycemic metabolism, both in the insulin secretion and its cellular action[3]. During pregnancy and lactation period, mothers provide larger amounts of calcium for the development of fetus and suckling neonate, respectively[4]. Given that the adult calcium and bone metabolism depends on vitamin D sufficiency, vitamin D sufficiency is likely to be especially critical during gestation and lactation[5].

There is an association between higher maternal vitamin D levels and low blood pressure in pregnant females.[6] Maternal vitamin D deficiency can be an independent etiological factor for pre-eclampsia. Vitamin D may interfere with various mechanisms involved in pre-eclampsia's pathogenesis and includes trophoblastic invasion and immunomodulation as well as control of blood pressure and proteinuria. Cord blood vitamin D status has been associated with tolerogenic immune regulation and rare respiratory infections in neonates.

The expression of 1-α hydroxylase is raised in placenta and kidney, in normal pregnancy, the concentration of serum 1,25-$(OH)_2$D increases from the first to the 3rd trimester. The role of 1,25-$(OH)_2$D during gestation to increase intestinal calcium absorption is since long recognized.[5]

The cut-off values used to define vitamin D deficiency and insufficiency are not well-established and remain controversial. However, there is an agreement to consider serum 25-(OH)D below 20ng/ml as inadequate low, and few evidence suggests that values more than 30ng/ml can be correlated with better health outcomes[7-8]. In pregnant females, the uncertainty regarding the optimal serum 25-(OH)D concentration is even higher. As long as the recommended values are not authenticated in clinical trials the disagreement will remain.

In our local population, 89% of the females are reported with vitamin D deficiency during pregnancy[9] while the parity of the females was not recorded being the limitation of the trial.

This study was planned to record the vitamin D deficiency during pregnancy in primigravidas so that we may enable to create the awareness in obstetricians and general population so that vitamin D deficiency may be overcome which will be helpful in reducing feto-maternal outcome associated with vitamin D deficiency.

The objective of this study was to determine the frequency of vitamin D deficiency during pregnancy in primigravid females.

[1]Senior Registrar / Department of Gynacology & Obstetrics, Services Institute of Medical Sciences, Lahore.
[2]Assistant Professor / Department of Gynacology & Obstetrics, Continental Medical College, Lahore
[3]Assistant Professor / Department of Gynacology & Obstetrics, Sahara for Life, Sughra Shafi Medical Complex, Narowal.
Correspondence: Dr. Salma Zaman, Email: salmazaman2007.sz@gmail.com, Cell: 0321-5861630

METHODOLOGY

A total of 100 primigravida pregnant women with singleton pregnancy between 18-35 years of age with more than 10 weeks of gestation were included in the study while those cases who were having history of vitamin D deficiency were excluded from the study. An informed consent from the patients was obtained to include their data in the study. A 5 cc blood sample was obtained with the help of paramedical staff and sent to the pathology lab for evaluation of 25 hydroxy vitamin-D levels and all the reports were reviewed, in our study we considered vitamin D deficiency as <20ng/ml levels of 25 OHvit-D3. We recorded all these information on a specially designed proforma. The collected data was evaluated through a statistical package for social science.

RESULTS

Mean age of the patients was recorded as 25.29±7.64 years. Frequency of vitamin D deficiency was recorded in 78% of the cases.

Table 1: Age distribution (n=100)

Age(in years)	n	%
18-30	82	82
31-35	18	18
Total	100	100
mean±sd	25.29±7.64	

Table 2: Frequency of vitamin D deficiency (n=100)

Vitamin D deficiency	n	%
Yes	78	78
No	22	22
Total	100	100

DISCUSSION

Vitamin D deficiency during gestational period may affect women as well as their newborn. This can lead to high bone turnover, hypovitaminosis D myopathy and osteomalacia in mothers. We planned this study to determine vitamin D deficiency in primigravidas so that the awareness may be created in general population, and obstetricians may take attention towards this important issue.

Our findings are in agreement with a study by Hossain N and others[8] conducted a study to determine the prevalence of vitamin D deficiency in Pakistani mothers and their newborns and to assess the correlation between maternal and neonatal serum levels of the vitamin D metabolite 25-hydroxy vitamin D3 and recorded that 89% of the females having vitamin D deficiency in pregnancy,[8] but did not mention the parity of the women being the limitation of the study, however, our study recorded 85% of the cases who were primigravida.

Sachan et al[10] investigated hypovitaminosis D in Lucknow, India and revealed that 84% of pregnant women had 25(OH) D values < 22ng/ml (the cut-off point in their research). Siddiqui and Rai[11] found that in Northern areas of Pakistan where sunlight was available in abundance, rickets was a common problem in neonates and children. They attributed the hypovitaminosis D to lack of awareness, malnutrition and antenatal factors.

Haroon Khan and others[12] determined the rate of vitamin D deficiency in the general population of Islamabad and its suburbs and recorded that females had significantly lower mean levels of Vitamin D (56.2%) compared to males (15.3%), but these females were not differentiated for pregnancy.

Another recent study[13] estimated the prevalence of Vitamin D deficiency in pregnant women attending a tertiary care hospital in Karachi and recorded that out of 349 females as 11 blood samples were haemolysed, (243) 69.6% females were found to be deficient in vitamin D and the mean levels were 27.33ng/ml. There was a positive correlation between lack of exposure to sunshine and levels of vitamin D($P<0.002$). No significant difference of vitamin D levels were found between different ethnic groups, these findings are in agreement with regards to frequency of vitamin D deficiency, the difference was that they also did not record this deficiency with regards to parity.

Finally, we are of the view that vitamin D deficiency in pregnancy is a major health problem in our population, however, data regarding parity is deficiency worldwide and in local setup as well. Our findings are primary and needs validation through someother local multicenter trials, thus, obstetricians should take special attention towards this important issue. In addition to sun exposure and dietary sources, vitamin D supplementation during pregnancy should be a public health intervention for purpose of improving maternal and infant health outcomes.

CONCLUSION

We concluded that the frequency of vitamin D deficiency is higher among pregnant women with primigravida. So, it is recommended that every pregnant woman presenting for antenatal visit, should be sort out for vitamin D deficiency.

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