

Original Research Article

Prevalence of vitamin D and B12 deficiency in pregnant women in Jammu, India

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ABSTRACT

Background: Micronutrient deficiency is pandemic proportions among pregnant women in India, but there is scarcity of searchable data on coexistence vitamin D status and Vitamin B 12 in pregnant women in Jammu and Kashmir, hence we have assessed the vitamin D as well as Vitamin B12 status in pregnant women attending outpatient department in a tertiary care hospital Jammu.

Methods: The study was conducted in the department of Biochemistry Government Medical College Jammu during June 2019 to February, 2020 and after obtaining informed consent, a total of 150 pregnant women, attending SMGS Hospital Jammu were screened for their vitamin D (25 OH-D) and vitamin B12 status by using Abbott architect chemiluminescent micro particle immunoassay.

Results: A total of 150 pregnant women were screened in the study, 129 (86%) were found to be having insufficient vitamin D levels in their blood (<30 ngm/dl) and 105 (70%) women showed severe deficiency with vitamin D levels below 20 ngm/dl. 108 (72%) pregnant women had vitamin B12 deficiency with levels below 200 pgm/ml.

Conclusions: The study revealed a high prevalence of coexistence of Vitamin D and Vitamin B12 deficiency in pregnant women, despite of abundant sunshine throughout the year and also with the consideration that people of this region are well off economically and can afford good nutrition.

Keywords: Jammu, Pregnant women, Prevalence, Vitamin D, Vitamin D deficiency, Vitamin B12, Vitamin B12 deficiency

INTRODUCTION

Deficiency of micronutrients has become a major public health interest. This is because of lack of awareness about balanced diet, inadequate intake of food and green vegetables and as major part of Indian population being vegetarian and not consuming animal foods, which are major source of micronutrients.¹

During pregnancy severe maternal 25(OH) D deficiency has been associated with biochemical evidences of disordered skeletal homeostasis, congenital rickets and fractures in newborn.^{2,3} Deficiency of vitamin B12 results in megaloblastic anemia. In most of the Asian countries

vitamin D or B12 levels during pregnancy are not performed routinely. Improving the vitamin D and B12 status worldwide would have dramatic effect on the public health and reduce health care costs for many chronic diseases.^{4,5} Few studies have evaluated the levels of vitamin D or Vitamin B12 in the serum of pregnant women.⁶⁻⁸

But very little data is available indicating concurrent deficiency of 25 (OH) D and Vitamin B12 in the early stages of pregnancy. Hence this study was undertaken to assess the levels of 25(OH) D and B12 in the pregnant women of this hilly area of union territory of Jammu and Kashmir.

METHODS

The study was conducted in the department of Biochemistry Government Medical College Jammu from the month of June 2019 to February 2020 and a total of 150 pregnant women attending SMGS Hospital Jammu were screened for their vitamin D (25 OH - D) and Vitamin B12 status. Blood samples were obtained from antecubital vein under aseptic conditions from each pregnant woman, duly following the guidelines and norms of the hospital and serum obtained from this was taken for vitamin D and Vitamin B12 level by using Abbott architect chemiluminescent microparticle immunoassay.⁹

The cut off value of vitamin D (25 OH -D) levels below 20 ngm/ml (<50 nmol/L) was considered as severe vitamin D deficiency, 20-30 ngm/ml(50 to 75 nmol/L) as insufficiency levels and levels more than 30 ngm/ml (>75 nmol/L) was taken as vitamin D sufficiency and for Vitamin B12 levels less than 200 pg/ml were taken as deficient. Women with previous history of diabetes mellitus, thyroid disorder, cardiovascular disorder, metabolic bone disorder were excluded from this study and women in the First and Second Trimester of Pregnancy were included in the study so as to help the clinicians to take therapeutic measures to have normal Pregnancy outcome. The results were analyzed by applying standard statistical procedures for inclusion of prevalence of Vitamin - D deficiency in the subjects.

RESULTS

A total of 150 pregnant women were screened for vitamin D (25 OH- D) and Vitamin B12 levels in their blood and 129 (86%) of these pregnant were found to have insufficient levels of vitamin D (<30 mg/dl), whereas 105 (70%) pregnant women had Vitamin D levels below 20 ngm/ml, the mean level was 12. 6 ngm/ml, only 21 out of 150 (14%) of the pregnant women were having levels above 30 ngm/ml with the mean value 48.2 ngm/ml.

Table 1: Prevalence of vitamin - D deficiency among pregnant women.

Study subjects	25 (OH) D status		
	Deficient <20 ngm/nl	Insufficient 20-30 ngm/ml	Sufficient >30 ngm/ml
Total subjects N = 150	105 (70%)	24 (16%)	21 (14%)
Mean value 25 (OH) d ngm/ml	12. 6	25. 5	48.2
First trimester N=90	50 (55.5%)	28 (31.1%)	12 (13.3%)
Second trimester N= 60	42 (70%)	11 (18.3%)	07 (11.6%)

Amongst 150 pregnant women screened, 90 were in the first trimester and 78 out of 90 (86.6%) were having low levels of vitamin D and 60 were in the second trimester and 53 out of these 60 (88.3%) were found to be deficient in vitamin D levels Out of these 150 pregnant women 108 (72%) were having vitamin B 12 deficiency with levels below 200 pgm/ml , out of 108 women having low levels of vitamin B12 in their blood 85 were in first trimester and 60 out of 85 (70.5%) were vitamin B12 deficient whereas 65 were in second trimester and 48 out of 65 (73.8%) had low levels of vitamin B12 in their blood.

Table 2: Prevalence of vitamin - B 12 deficiency among pregnant women.

Study subjects	Vitamin B 12 status	
	Deficient <200 pgm/ml	Sufficient >200 pgm /ml
Total subjects N = 150	108 (72%)	42 (28%)
First trimester N=85	60 (70.5%)	25 (29.5%)
Second trimester N= 65	48 (73.9%)	17 (26. 1%)

DISCUSSION

Micronutrient deficiency has assumed a shape of pandemic, yet it is the most under diagnosed and undertreated nutritional deficiency in the world.^{10,11} Different studies have been conducted to evaluate the levels of vitamin D and B12 in the general population, but there is scarcity of searchable data on the prevalence of coexistent of Vitamin D as well as B12 deficiency in pregnant women. This study has shown an alarming picture of high prevalence of Vitamin D and B12 deficiency in otherwise healthy pregnant women of this hilly region of the country.

In this study, a total of 150 pregnant women were screened for vitamin D and Vitamin B12 levels in their blood and 129 (86%) women were found to be having vitamin D insufficiency. Similar results have been shown by EL Koumi et al, It was shown that only 35.8% of pregnant women had vitamin D levels above 20 ngm/ml.¹² Studies conducted in other parts of the world also have shown that the prevalence of vitamin D deficiency is high in many European countries as well.¹³ In accordance with this studies. Vitamin D deficiency has been recognized as a very important contributory factor to increased risk of pre-eclampsia and women with 25(OH)D levels below 15 ngm/ml had fivefold increase risk of preeclampsia.¹⁴ This study has found an alarming rate of vitamin B12 deficiency with 108 out of 150 (72%) pregnant women showing low levels of vitamin B12 in their blood. In a large study conducted in Pune (Pune Maternal Nutritional Study), 71% of pregnant mothers at 28 weeks of gestation had low vitamin B12 levels.¹⁵ In a longitudinal study from Mysore, 42% mothers were deficient in vitamin B12 and there was a

positive association between B12 levels and their children sampled at 9.5 years of age.¹⁶ Similar findings were reported by Yusufji et al, from Vellore.¹⁷

The present study had a few limitations. As it was conducted in patients attending out patients services of a tertiary government hospital and it is very likely that lower sections of the society were overrepresented in this study but to conclude it may be said that there is high prevalence of coexistent deficiency of vitamin D as well as B12 deficiency in this part of the country.

CONCLUSION

The analysis revealed a high prevalence of Vitamin D and Vitamin B12 deficiency in pregnant women despite of abundant sunshine throughout the year and also with the consideration that people of this region are well off economically and can afford good nutrition, It is recommended that all pregnant women with one or more risk factors for micronutrient deficiency be monitored to reduce the risk of negative effects on mother and their babies. Further it is highly suspected that micronutrient deficiency may represent other underlying public health problem in Jammu and Kashmir that should be explored.

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Ethical approval: Not required

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