



## Research Article

# Prevalence of Vitamin D Deficiency in Pregnant women

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### Abstract

*Vitamin D is not only a lipid soluble vitamin, but also a steroid hormone that can be synthesized endogenously in the skin by exposure to sunlight and its deficiency is known to be involved in impairment of immune function, predisposition to cancer, cardiovascular disease, diabetes, rheumatic disease, muscle weakness, chronic pain and neuropsychiatric dysfunction in addition to disturbed calcium and phosphorous homeostasis. Vitamin D deficiency is common during pregnancy especially among high risk groups like vegetarians, women with limited sun exposure like those living in cold climates, residing in northern latitudes, or wear sun and winter protecting clothings and ethnic minorities especially those with darker skin. It is an important risk factor for infantile rickets, poor fetal growth and neonatal development. In addition, vitamin D deficiency in pregnant women may predispose to gestational diabetes and preeclampsia. The present study was undertaken with the aim to evaluate the prevalence of vitamin D deficiency in this northern state of Jammu and Kashmir. A total of 120 pregnant women were screened for Vitamin D (25 –OH D), out of this 52 (43.3 %) were having Vitamin D levels below 20 ngm/ml, 41 (34.1%) and 27 (22.5%) had levels between 20–30 ngm/ml and above 30 ngm/ml respectively. The study showed alarming high prevalence of vitamin D deficiency in otherwise healthy pregnant women and undermines the need to carry further research in this area.*

### Introduction

Vitamin D is fat soluble vitamin obtained largely from exposure to sunlight, fortified milk or juice, fish oils and dietary supplements. Vitamin D synthesized endogenously in the skin undergoes hydroxylation in the liver to form Hydroxy Vitamin D (25-OH-D), Due to its larger half life time, 25 –OH-D is considered the best biomarker of vitamin D status. 25 OH –D is then metabolized in the kidney by the 1- alpha

hydroxylase to form active steroid hormone 1, 25 –dihydroxy vitamin D. The ubiquitous presence of vitamin D receptors in most tissues, including placenta, suggests that Vitamin D may have other roles as well. Adequate vitamin D intake is associated with a lower risk of cancer<sup>(1,2,3,4,5)</sup>, cardiovascular disease<sup>(6)</sup>, autoimmune disease<sup>(7)</sup>, neurological disorder and diabetes<sup>(8)</sup>. In addition, an increasing number of studies suggest that vitamin D deficiency during pregnancy is

associated with multiple adverse health outcomes in mothers like gestational diabetes, preeclampsia, wheezing in neonates, low bone mineral density, type 1 diabetes, and eczema in children.<sup>(9,10)</sup>

There is growing concern about health consequences of the high prevalence of vitamin D deficiency worldwide among general population, including pregnant women. Deficiency of vitamin D is common in other parts of the world. There are very few studies on vitamin D status in pregnant women in this part of the country, hence this study was undertaken with the aim to carry random sample survey on vitamin D status in pregnant women residing in this hilly state of Jammu and Kashmir.

### Material and Methods

The study was conducted with the support of National Health Mission, J & K under the National Janani Shishu Suraksha Karyakaram Yojna (JSSK) by providing free diagnostic services to all the pregnant women attending the Govt run hospital. A total of 120 pregnant women attending SMGS Hospital Jammu were screened for their vitamin D (25 –OH – D) status. Blood sample were obtained from antecubital vein under aseptic conditions from each pregnant women with their consent, duly following the guidelines and norms of the hospital and serum obtained from this was taken for vitamin D level by using Abbott architect chemiluminescent microparticle immunoassay<sup>(11)</sup>. The cut off value of vitamin D (25 OH –D) level 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) as vitamin D sufficiency. A total of 120 pregnant women during their 1<sup>st</sup> trimester were analyzed for their Vitamin D status. Women with previous history of diabetes mellitus, thyroid disorder, Hypertension and cardiovascular disorder, metabolic bone disorder and hyperparathyroidism were excluded from this study. The results were analyzed by applying standard statistical procedures.

### Results

A total of 120 pregnant women were screened for Vitamin D (25 –OH- D), out of this 52 ( 43.3 %) were having Vitamin D levels below 20 ngm/ml , the mean level was 11.2 ngm/ml, 41(34.1%) were having vitamin D level between 20-30 ngm/ml with a mean value of 25.6 ngm/dl and 27(22.5%) of the pregnant women were having levels above 30 ngm/ml with the mean value 47.5 ngm /ml of vitamin D in their blood. The lowest and highest values of Vitamin D in pregnant women were 2.8 ngm/ml and 71.7 ngm/ml respectively. The study also revealed that with increasing age of mother the incidence and severity of Vitamin D insufficiency was more as compared to young expecting mothers

### Discussion

The study showed alarming high prevalence of vitamin D deficiency in otherwise healthy pregnant women. Vitamin D deficiency among pregnant women is a worldwide epidemic; different studies have shown a prevalence ranging from 18 – 84% depending on the country of residence and local customs. In this study a total of 120 pregnant women were screened for vitamin D (25-OH-D) levels in their blood and a total of 93 (77.5%) were found to have insufficient levels of vitamin D in their blood with Similar results have been shown in a study conducted by El Koumi et al<sup>(12)</sup>, it was reported that only 35. 8% of pregnant women had blood levels over 20 ngm/ml. In another study conducted in India, it was found that 84% of pregnant women had vitamin D concentration < 22.5 ngm/ml<sup>(13)</sup>, in accordance with our findings. Studies conducted in other parts of the world also have shown that the prevalence of vitamin D deficiency (25–OH-D ,< 20 ngm/ml) is high in many European countries as well<sup>(14)</sup>. Vitamin D deficiency at or before 22 weeks of gestation has been reported as an independent predictor of preeclampsia and women with 25(OH) D levels <15 ngm/ml had five fold increase in the risk of preeclampsia. Preeclampsia and hypertensive diseases complicate 3-10% of

pregnancies and contribute significantly to maternal and neonatal morbidity and death<sup>(15)</sup>. The current Vitamin D recommendations for pregnant women are clearly insufficient to prevent and even more to treat vitamin D deficient pregnant women. However, results of recently conducted randomized controlled trials on Vitamin D supplementation in pregnancy suggest a safe dose of 2000-4000 IU/day<sup>(16,17)</sup>. As vitamin D supplementation is simple and cost effective with a low likelihood of toxicity, it can be recommended in all pregnant women to keep serum levels of 25 OH –D in the normal range of adults (>32 ng/ml) for prevention of preterm birth or preeclampsia

### Conclusion

Vitamin D deficiency is a common condition among pregnant women. Early preventive measures should be taken at the slightest suspicion of vitamin D deficiency in pregnant women, to reduce morbidity during pregnancy and lactation as well as its subsequent impact on fetus, the newborn and the child. Further studies are needed to support a recommendation for screening all pregnant women for vitamin D deficiency.

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