

VITAMIN-D DEFICIENCY DURING PREGNANCY;

Serum 25 hydroxy vitamin-D level is the best predictor.

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ABSTRACT... Objective: To find out the frequency of vitamin-D deficiency during pregnancy by using Serum 25 hydroxy vitamin-D3 level and to evaluate the risk factors associated with low level of vitamin-D. **Study Design:** Cross Sectional Study. **Setting:** Gynae and obstetric unit II in Abbasi Shaheed Hospital Karachi. **Period:** February 2011 to July 2011. **Material and methods: Design:** All patients with history of chronic renal disease, liver disorder, PIH, GDM, twin gestation, anti tuberculous treatment and antiepileptic treatment with excluded. Data was collected by predesigned proforma through personal interview. **Result:** This study showed 49 cases (98%) of primigravida were vitamin-D deficiency. The highest low level was in 15-25 years of age. The mean concentration of 25bOH vitamin-D 3 was 10.30ng/ml. 60 % of women had severe vitamin-D deficiency with level of 25 OH vitamin-D3 was less than 10ng/ml. Risk factors associated with low level of vitamin-D3 included dietary deficiency, lack of sun exposure and practicing veil. **Conclusions:** Pregnant women including primigravida in Pakistan are at risk of vitamin-D deficiency. 25 (OH) assay should be used as an aid in assessment of vitamin-D deficiency during pregnancy so that proper correction can be achieved. Women who are deficient in vitamin-D should be counseled regarding maternal and neonatal risk, a balanced diet, limited sun exposure and compliance of vitamin-D supplement to ensure normal maternal and fetal outcome. Every women should provided by vitamin-D supplement prior to pregnancy.

Key words: 25 (OH) vitamin-D, Pregnancy, Primigravida.

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INTRODUCTION

Vitamin-D is a fat soluble steroid hormone precursor that is mainly produced in the skin by sun light exposure or can be obtained by dietary sources mainly egg yolk, milk, fish and plants. Vitamin-D is biologically inert having two forms vitamin-D3 and vitamin-D2 and undergo two successive hydroxylation in liver and kidney to become the biologically active 1,25 dihydroxy vit.-D¹. 25 OH vit-D is the major storage form of vitamin-D in human body. More than 95% of 25-OH vit. Dis measurable in serum is 25 OH vit-D3. Where as 25-OH vit-D2 can be measured only if patient taking vit-D2 supplement². Normal vitamin-D serum level is >30ng/ml while <20 ng/ml indicates deficiency. It may be nutritional or secondary to metabolic disorder. Nutritional deficiency is particularly common in women of Asia because of wearing a veil or other body coverings. Diet deficient in egg, milk, fish, dark skinned women, lack of sun exposure are the risk factors for vitamin-D deficiency. Vitamin-D deficiency during pregnancy is associated

with preeclampsia, preterm labor, low birth weight baby, impaired growth in infancy, autoimmune diseases during childhood, asthma and diabetes, certain cancers, therefore vitamin-D supplementation in adequate amount is recommended in at risk groups^{3,4}. Women who take vitamin-D supplements during pregnancy have a greatly reduced risk of complications. There is argument, therefore, for supplementation in diet, in order to avoid the consequences of deficiency during pregnancy. The WHO recommend 400iu of vitamin-D daily during normal pregnancy which maintain 25 (OH) vitamin-D level of about 30ng/ml. Value of 30ng/ml or more are needed to ensure normal pregnancy outcome⁵.

Pregnant women and their neonates living in Pakistan are at risk of vitamin-D deficiency, current prenatal vitamin-D supplement may be inadequate to achieve desired serum 25 hydroxy vitamin-D concentration. There are few studies about deficiency of vitamin-D among primigravida. So this study was performed to

determine the frequency of vitamin -D deficiency among primigravida in our local population using serum 25 OH vit-D level to provide adequate supplement prior to conception in order to prevent maternal and neonatal risk during pregnancy because prevention is better than cure.

MATERIAL AND METHOD

This is cross sectional study which was carried out at outpatient clinic of Abbasi Shaheed Hospital Karachi in Gynae & obst. Unit-II associated with Karachi Medical and Dental College. The data was collected in OPD from February 2011 to July 2011. The study protocol was approved by Ethics committee of Hospital. All subject gave informed consent. Data collected by administration of a structured performa through personal interview including age, gestational age, diet including milk, fish and vitamin-D, sun exposure and type of clothing esp. using veil. Pregnancy with chronic liver disease, renal disease, PIH, gestational diabetes, anti tuberculous and antiepileptic drugs and twin gestation were excluded. Maternal blood sample collected in lab for measurement of 25 hydroxy vitamin-D levels by Elecsys method on Roche cobas e 411. Normal limit for 25 OHvit-D3 levels is 20-30 ng/ml. We classified serum level of 25 OH vit-D into 4 groups, >20ng/ml is normal, 15-19.9 ng/ml as mild deficiency, 10-14.99 ng/ml as moderate and <10 ng/ml as severe deficiency Data were analyzed by SPSS version 13. Results presented in tables using statistic of mean and percentages.

RESULTS

This study showed 98% of primigravida were vitamin-D deficient. Most of the pregnant women belong to 18-25 years of age. Mean age was 23.18 years (Table-I).

Vitamin-D deficiency found in all gestation even prior to 20 weeks of gestation as shown in table-II.

The mean concentration of 25 OH vit-D was 10.30

ng/ml. In our study 60% of women were severely deficient, had value of 25 OH vit-D <10ng/ml as shown in table3. Risk factors associated with low level of 25 OH vit-D3 were dietary deficiency including milk, egg and fish. Even 48% women were taking milk regularly were mild to moderately vitamin-D deficient. 12% women were using fish and 6% eggs, were also had deficient level. About 82% of women practicing veil and all women exposing to sun light daily for at least 15 min.

Age (years)	No. of cases	No. of vit-D deficient	%age
18-25	40	39	78.0
26-35	09	09	18.0
>36	01	01	02.0

Table-I. Age wise distribution
Mean age = 23.18 S.D=3.49

Gestational age in weeks	No. of vit-D deficient cases	%age
<20	16	32.0
20-30	13	26.0
31-36	15	30.0
>36	06	12.0

Table-II. Gestational age and vitamin-D deficiency
Mean=25.80 S.D=9.07

Serum level of 25 OH vit-D (ng/ml)	No. of vit-D deficient cases	%age
20-30	01	02.0
15-19.99	03	06.0
10-14.99	16	32.0
<10	30	60.0

Table-III. Vitamin D deficiency acc. to serum level of 25 OH vit-D
Mean= 10.30 S.D=9.32

DISCUSSION

Vitamin-D deficiency among expectant women is a global public health concern. The serum concentration of 25 OH-D is typically used to determine vitamin-D status. It reflects vitamin-D produced in the skin as well as that acquired from the diet. It does not reveal the amount of vitamin-D stored in other body tissues. Several studies have identified high prevalence of vitamin D deficiency during pregnancy in temperate region such as UK, Norway and even in sun shine countries such as Pakistan, India and Saudi Arabia⁶. In our study 98% primigravida are vitamin-D deficient which is much higher as compared to other reported >50%⁷, 71%⁸, 86%⁹, 40%¹⁰ and 70%¹¹. These findings suggest that subclinical vitamin-D deficiency is still a cause for concern in Asian women despite that these women lived in a sun rich climate for most of the year. In our study serum 25-OH-D mean concentration in patients was 10.30 ng/ml. Comparison of 25-OH-D concentration between published studies can be difficult since laboratory techniques vary¹², and variation in the definition of vitamin-D deficiency. This is a limitation of this study, comparative data are nonetheless compelling. According to most of our subjects had severe deficiency in 60% cases with 25-OH-D level about <10ng/ml. While other showed moderate deficiency in 51.8%²¹, 57.6%¹³. This prevalence is reported based on an old definition of vitamin-D deficiency, and many investigators now define deficiency as <80 nm/l or 32 ng/ml circulating 25-OH-D. Based on this cut off, only 2% of pregnant female in our study had normal serum vitamin-D level. The high incidence of vitamin-D deficiency probably because of prolonged deficiency of dietary calcium intake among poorer parts of country because of expensive nature of milk. In our study 48% women used to take 1 glass of milk regularly but they were deficient, therefore assessment of dietary intake alone may not be the best predictor of vitamin-D status. Rather, serum analysis continues to serve as a reliable method.

In our study 82% women practicing purdah (veil) might have associated with high prevalence of deficiency wearing clothing or total sun screen, the cutaneous release of vitamin-D is completely blunted, so in the light of above facts, a DRI of 400 iu/daily in adult is not sufficient to maintain normal circulating concentration of vitamin D in adults¹⁴. Low serum 25-OH-D can result from avoiding sun exposure. Holick recommended that sub thermal exposure of face, arms and hands = 3 times a week is sufficient for elderly people living in temperate climate to maintain serum 25-OH-D at 20 ng/ml.

Assays for 25-OH-D are not routine medical test and are not cost beneficial but current evidence strongly support routine screening for vitamin-D deficiency at booking visit. Further more adequate supplementation to correct deficiency at early pregnancy should be initiated to minimize risks.

CONCLUSIONS

Vitamin-D supplementation should be part of pre pregnancy counseling. Vitamin-D level should be checked in each pregnant woman and is the best predictor of vitamin-D deficiency and necessary to provide proper treatment because routine prophylaxis cannot fulfill requirement in each women.

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*The while we keep a man waiting,
he reflects on our shortcomings.*

Proverb, French