Original Research Article

IMPACT OF SERUM VITAMIN D LEVELS ON THE PRETERM RUPTURE OF THE MEMBRANE IN PREGNANT WOMEN. A CROSS-SECTIONAL STUDY

ABSTRACT follow correction highlighted with yellow

Aim: To assess the association between premature rupture of membrane and maternal blood vitamin D levels.

Study design: A cross-sectional study

Place and duration: Abbasi Shaheed Hospital, Karachi Medical and Dental College from April 2020 to April 2021.

Methodology: Over one year, a total of 100 patients with vitamin D levels, as well as obstetrical abnormalities and risk factors, were monitored. In 88 pregnant women, vitamin D deficiency was observed. Pregnant women who have a thyroid disorder, such as thyroiditis or Grave's disease, had calcium or parathyroid disease in the past or needed cardiac medication therapy,&diuretics, particularly calcium channel blockers, were excluded from the study.

Results: VitaminD deficiency was found in 88 pregnant women out of 100. It was more prevalent among housewives (86.36 percent) and multiparous women (68.0 percent). Pregnancy complications were present in 33.0 percent of cases, such as preeclampsia, gestational hypertension, and diabetes, and PROM was less prevalent in the deficient group.

Comment [h1]:

Conclusion: Our data indicate that pregnant females are at a greater risk of Vitamin D deficiency and associated pregnancy complications. The correlation between maternal vitamin D levels & preterm rupture of the membrane was not statistically significant.

Keywords: Vitamin D Level, Premature Rupture of Membrane, Pregnant women.

INTRODUCTION: For all nourishment,the requirement from conception to delivery of the embryo is fully dependent on the mother. The deficiency of vitamins is widespread among pregnant women**,** and it can have a severe influence on the Pregnancy outcome(1). Several clinical investigations have suggested an association between low Vitamin D levels and the risk of anadverse pregnancy outcome (2, 3).Numerous studies have shown that part of the harm caused by vitamin D deficiency starts while the fetus is still growing. Much of the damage may be irreversible, and taking Vitamin D after delivery will not be able to repair it. Vitamin D deficiency has been found to affect anywhere from 15% to 80% of the population (4)(5, 6). The liver is the first place where increased 25 (OH) Dis hydroxylated. The Kidney is mainly accountable for the second hydroxylation of 1, 25 (OH) D to the active state, controlled by phosphorus, calcium, and parathyroid hormone levels (7). Vitamin D has minimal biological activity on its own, but enzymatic conversion to [1, 25 (OH) 2D] results in a hormone with a range of biological effects.The impact of 1,25 (OH)2D is sustained by its high affinity for the Vitamin D receptor, which may be found in various tissues such as the placenta, indicating that Vitamin D serves a role other than bone metabolism. (2) The blood level of 1, 25 (OH) D doubled throughout Pregnancy, starting at 10-12 weeks of Pregnancy & peaking in the third

trimester. Through the placenta, calcium is transferred to the fetus from the mother. The fetal Skelton has acquired roughly 25-30g of calcium at the time of delivery, most of which is transported in the last trimester. (8)Deficiency of vitamin D may be detected by measuring the circulation concentration of 25 (OH) D;while there is no general agreement on what amount of 25 (OH) D is optimal, many experts think that a range of 75 nmol/L is appropriate, and also that serum Vitamin D amounts below 50 nmol/L suggest insufficiency. (9)

Vitamin D plays a role in preterm labor' pathophysiology by affecting inflammation and immunomodulation pathways. During Pregnancy, the deficiency of vitamins has been associated with preeclampsia, insulin sensitivity, and gestationaldiabetes mellitus due to its non-classical effect(10). This current study wasperformedto determine the association between maternal vitamin D levels and premature rupture of membrane.

METHODOLOGY

A cross-sectional observational study was conducted in the OBG department and coordinated with the Biochemistry department. The study included 100 pregnant females in their third trimester who were admitted to the labour ward. The Institute Ethics Committee authorized this study. After counselling and informed permission, all pregnant females were submitted to serum Vitamin D testing.All pregnant females at term, regardless of age or parity, were included in this study. Pregnant women who have a present thyroid disorder, such as thyroiditis or Grave's disease, who had calcium or parathyroid disease in the past, or who need cardiac medication therapy,&diuretic particularly calcium channel blockers, were excluded from the study.

A questionnaire was used to acquire information from the mother about her age, parity, and obstetric history. The beginning day of the last menstrual cycle was used to calculate gestational

Comment [h2]: The research methods part needs a lot of clarification and explanation. How to collect the cross-sectional sample. Sample collection methods, type of research sample and place of sample collection

age (in weeks). In addition, a history of iron and calcium intake was recorded. Haemoglobin and serum vitamin D levels were tested in the blood. High-risk factors included anemia, preeclampsia, & diabetes. The levels of vitamin D in the blood were measured. According to the study, vitamin D deficiency was less than 30ng/ml, and sufficient was 30-100ng/ml.(11, 12)

Data was put in the SPSS-20 version for analysis. The relationship between Vitamin D Category and Maternal Outcome was investigated using the Chi Square type/Fisher Exact type and provided frequency and percentage.

RESULTS:

The current study involved 100 participants admitted to the Obstetrics and Gynecology department. The majority of patients in the Vitamin D Deficient group were >30 years old (31.82%), housewives (86.36%), had less sun exposure (63.64%), were not supplemented with Vitamin D (90.90%), were multigravida (68.18%), and lived in cities (72.73 percent) (As shown in Table 1)

Table 2 demonstrates that just 12% of pregnant women were Vitamin D adequate, while the rest were deficient(should be first table). Table 3 summarizes the maternal consequences in the Vitamin D deficient group without problems, which is not statistically significant explain .Table 4 shows the Pregnancy with ~~complications~~complications explain

Table 1: Sociodemographic profile of individuals based on vitamin D levels~~((100).~~100)

Parameters	**Total** **n = 100**	**Vitamin D deficient (88)** < 30 years >30 years	**Vitamin D sufficient(12)** >30 years	**P-value**
< 30 years >30 years (Remove)	69 31	60 28	9 3	0.750
House wife Working	86 14	76 12	10 2	0.67
Exposure to sun More ? Less ? What are the criteria for that?	 42 58	 32 56	 10 2	0.003
Supplement Yes No	 18 82	 8 80	 10 2	0.000
Number of gravida Primiparous Multiparous	 36 64	 28 60	 8 4	0.025

Rural Urban	33 67	24 64	9 3	0.002

Table 2: Vitamin D status of study participants(~~The~~ the figure is better than the table and should be arranged before table 1

Status of vitamin D	**Number**	**%**
>30ng/ml	12	12
<30ng/ml	88	88

Table 3: Vitamin D levels and maternal outcomes(needs revision)

Vitamin D level	Pregnancy without complication n = 63	Pregnancy with complications n = 37	P-value
Vitamin D sufficient n = 13 worng (12)	9	4 (3) Based on the result of table 4	0.61
Deficient of vitamin D n = 87 (88)	54	33	0.614

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Table 4: Pregnancy with complications(the results need more explainations)

Level of Vitamin D	Preterm labor	Infection	Gestational diabetes	Pre-eclampsia	Hypertension	PROM
Sufficient Vitamin D	Nill	2	Nill	Nill	1	Nill
Deficient Vitamin D	13	5	4	2	3	6

DISCUSSION

Deficiency of vitamin caused by the female's lifestyle, insufficient dietary Vitamin D consumption, and the lack of Vitamin supplements and spending the most of the day in the room.Females over the age of 30 (68.18 percent, P=0.75), housewives (8 percent, P = 0.674), with less sunlight exposure (63.64 percent, P =0.003), whodid not take vitamin D supplements (90.90 percent, P =0.000), who's lived in cities (72.73 percent, P =0.002), as well as multiparous (68.18 percent, P =0.026) deficiency of Vitamin D was more common. Our data show a statistically significant relationship between low vitamin D levels, lack of vitamin D supplementation, and multiparous women.

Andrian et al. observed deficiency of Vitamin D in the group of low socioeconomic status (13), whereas, Atiq et al. observed lower blood levels of Vitamin D in mothers and newborns from the upper socioeconomic group, who typically chose to live indoors and avoided direct sunlight.(14)Vitamin intake is likely to be higher in numerous pregnancies. Vitamin D levels in the diet should be 400IU/day if sunlight exposure is insufficient.

This study shows that Vitamin D deficiency was substantially more frequent in our study, with values of less than 30 ng/ml in the third trimester in 88% of the patients. The findings were comparable to those of I.Pehlivan, S.hatun, and colleagues in 2000(15). Alagol et al. detected low serum25-hydroxyvitamin D3 in 66 percent of reproductive-age women in a study conducted in Istanbul in August 1998(16). deficiency of Vitamin D was shown to be prevalent in 48.2 percent of pregnant women in a study performed by Dava A et al.(17).

Vitamin Ddeficiency has been connected to negative health effects. The vitamin D deficient group had a no maternal problems in 54 percent (P=0.618) in this study, although this correlation was not significant statistically. Compared to females with normal vitamin D levels, vitamin D deficiency was connected to the same maternal outcomes in terms of PROM, preterm labour, diabetes, and hypertension. According to Abdulbari B. 2013, pregnant women witha vitamin D deficiencyhave a higher risk of maternal complications than those with normal vitamin D levels(18).

Discussion needs more explanations

CONCLUSION - Recommendations ?????

According to the findings of this study, pregnant women have a significant prevalence of Vitamin D deficiency, and pregnancy complications like premature rupture of membrane preterm labor, gestational diabetes and hypertension are not statistically significant. On the contrary, many academics and experts are increasingly disputing the link between vitamin D deficiency and medical complications. In fact, there have been reports of connections with pregnancy-related problems. We suggest increasing vitamin D supplementation or sun exposure in all pregnant women.

Permission

Permission was taken from the ethical review committee of the institute

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