



ROLE OF VITAMIN D SUPPLEMENTATION IN PREVENTION OF PRE ECLAMPSIA IN PREGNANT WOMEN OF DELHI - A STUDY IN 450 BEDDED TERTIARY CARE MATERNITY HOSPITAL OF WALLED CITY OF DELHI.

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ABSTRACT **OBJECTIVE:** To study the role of vitamin D supplementation in reducing the risk of pre eclampsia and to study fetomaternal outcome in supplemented group and non supplemented group at term pregnancy.
METHODS: Group I included 100 pregnant women who received vitamin D supplementation in the form of oral cholecalciferol sachet 60,000IU weekly till 10 weeks along with routine iron, folic acid and calcium supplementation. Group II comprised of 100 pregnant women who received only routine iron, folic acid and calcium supplementation. At term role of vitamin D supplementation in prevention of pre eclampsia and feto-maternal outcome of the two groups were compared.
RESULTS: Vit D supplementation during pregnancy was associated with decreased risk of pre eclampsia at term. 22(11%) patients developed pre-eclampsia and out of 22 patients, 3 patients were vitamin D supplemented and 19 patients were not vitamin D supplemented. **Incidence of GDM, preterm birth, cesarean section, NICU admission, tetany in newborn were not influenced by vitamin D supplementation.**
CONCLUSIONS: At present, vitamin D supplementation is not a part of antenatal care programs in India. For recommendations concerning routine vitamin D supplementation during pregnancy, further clinical trials are required with larger sample size.

KEYWORDS : VITAMIN D, PRE-ECLAMPSIA ,LOW BIRTH WEIGHT, NICU ADMISSION.

INTRODUCTION:

Pre eclampsia occurs in 2-5 % pregnancies and is a major cause of perinatal and maternal mortality and morbidity.¹ Compared to normal pregnancies, vitamin D metabolism is markedly altered in pre eclampsia. The pathogenesis of pre eclampsia involves a number of biological processes that may be directly or indirectly affected by vitamin D, including immune dysfunction, placental implantation, abnormal angiogenesis, excessive inflammation, and hypertension.^{2,3,4} Compared to normal pregnancies, vitamin D metabolism is markedly altered in pre eclampsia. This may be due to reduced placental 1- α -hydroxylase activity⁵ resulting in lower circulating calcitriol concentrations compared to normotensive or chronically hypertensive pregnant women.^{6,7} It has been reported that the serum concentration of 25(OH)D in early pregnancy is reduced in women who subsequently develop pre eclampsia.⁸ 1,25(OH)₂ vitamin D may play a key role in maintaining immunologic tolerance in pregnancy, and adequate vitamin D may help in the prevention and management of preeclampsia.⁹

At present there is not enough evidence to establish the effectiveness of vitamin D supplementation in pregnancy and therefore, vit D supplementation is not routinely offered to all pregnant women. The Cochrane databases suggest more research is needed in vitamin D supplementation in pregnancy in association with pre eclampsia.

Materials and methods:

The study was conducted in department of obstetrics and gynaecology at Kasturba hospital from Jan 2016 to Dec 2016. The study was conducted after ethical clearance from the institutional ethical committee. The study subjects were recruited from patients attending antenatal clinic of Kasturba hospital.

A written informed consent was taken from all the recruited patients. Women with the following criteria were excluded from the study: 1) Gestational age <16 weeks or >20 weeks 2) Subjects residing outside Delhi 3) Multigravidae 4) Multiple pregnancy 5) Subjects having hypertension, family history of hypertension, liver disease, renal disease, renal calculi, inflammatory bowel disease, secondary osteoporosis, rheumatoid arthritis, morbid obesity, treatment with ATT or anti-epileptic drugs in previous 6 months, taking vitamin D or calcium supplementation in previous 1 year, diabetes, family history of diabetes. 6) Subjects with pre-existing calcium and parathyroid condition, requiring chronic diuretics or cardiac medication, having chronic HTN, active thyroid disease. 200 pregnant women of 16-20 weeks gestation were included in the study. They were randomly

assigned into two groups that is study group and control group. Study group comprised of 100 pregnant women of 16-20 weeks gestation who received vitamin D supplementation (irrespective of vitamin D level) in the form of oral cholecalciferol sachet 60,000IU weekly till 10 weeks along with routine iron, folic acid and calcium supplementation. Control group comprised of 100 pregnant women of 16-20 weeks who received only routine iron, folic acid and calcium supplementation (irrespective of vitamin D level). At first antenatal visit a detailed history was obtained and thorough examination and routine antenatal investigations of all the subjects was done. At term role of vitamin D supplementation in prevention of pre eclampsia.

Role of vitamin D supplementation and Maternal outcome in terms of preeclampsia, GDM, preterm labour, Mode of delivery and fetal outcome in terms of LBW, NICU admission, tetany of the two groups was compared.

Statistical evaluation:

All the data was entered in Microsoft excel sheet and various variables were compared by applying chi-square test as a test of significance for nominal and numerical variables with the help of computer using Statistical Package of Social Sciences and Problem Solutions (SPSS)-16.0 software. Statistical significance was considered if p value was < 0.05.

Results:

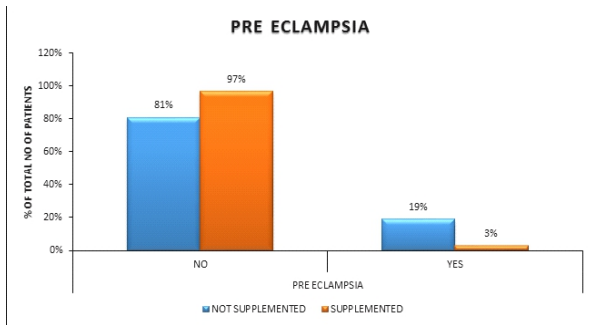
The mean age in this study was 24.5 years. Most of the patients (75.50%) belonged to lower socio-economic class. In our study there is a statistically significant correlation established between vitamin D supplementation and reducing risk of pre eclampsia.

MATERNAL OUTCOME IN VITAMIN D SUPPLEMENTED AND NON SUPPLEMENTED GROUP:

A) Pre-eclampsia: Out of 200 patients, 22(11%) patients developed pre-eclampsia and out of 22 patients, 3 patients were vitamin D supplemented and 19 patients were not vitamin D supplemented. 178(89%) didn't develop pre eclampsia out of which 97 were supplemented with vitamin D and 81 were not supplemented with vitamin D. Majority of patients who developed pre eclampsia belonged to vitamin D non supplemented group. The p-value was 0.0004 making this correlation statistically significant.

TABLE 1: CASES OF PRE-ECLAMPSIA IN VITAMIN D SUPPLEMENTED AND NON SUPPLEMENTED GROUP:

		STATUS OF SUPPLEMENTATION WITH VITAMIN D		Total	p value
		SUPPLEMENTED	NOT SUPPLEMENTED		
PRESENCE OF PRE ECLAMPSIA	NO	97 (97.00%)	81 (81.00%)	178 (89.00%)	0.0004
	YES	3 (3.00%)	19 (19.00%)	22 (11.00%)	
Total		100 (100.00%)	100 (100.00%)	200 (100.00%)	



Discussion:

Vitamin D deficiency and insufficiency are common in pregnant women of Delhi. In the present study a significant association was found between vitamin D supplementation with reduction in risk of pre eclampsia such association is also seen in several other studies given in table 6. **Vitamin D supplementation reduces the incidence of pre-eclampsia hence emphasizing the role of vitamin D supplementation in improving fetomaternal outcome. Incidence of gestational diabetes mellitus, preterm birth, cesarean section, NICU admission, tetany in newborn were not influenced by vitamin D supplementation in our study.**

TABLE 2: INCIDENCE OF PRE-ECLAMPSIA AFTER VITAMIN D SUPPLEMENTATION IN DIFFERENT STUDIES

S.NO.	AUTHOR	YEAR	p-value	RR/OR
1.	Haugen et al ¹⁰	2009	-	0.73
2.	Baker et al ¹¹	2010	0.01	5.41
3.	Parul et al ¹²	2012	<0.001	0.375
4.	De-Regil LM et al ¹³	2012	-	0.67
5.	Hypponen et al ⁹	2013	0.001	
6.	Naghshineh et al ¹⁴	2016	0.09	
7.	Present study	2016-2017	0.0004	

At present, vitamin D supplementation is not a part of antenatal care programs in India. The US National Academy of Sciences mentions 400 IU/day as the reference dietary intake during pregnancy but several investigators worldwide are arguing for revised guidelines for higher vitamin D allowance during pregnancy. This may call for vitamin D supplementation to mothers. At this time there is insufficient evidence to support a recommendation for screening all pregnant women for vitamin D deficiency. While there is some evidence that vitamin D supplementation could reduce the risk of pre-eclampsia. For pregnant women thought to be at increased risk of vitamin D deficiency, maternal serum 25-hydroxy vitamin D levels can be considered and should be interpreted in the context of the individual clinical circumstance. For recommendations concerning routine vitamin D supplementation during pregnancy, further clinical trials are required with larger sample size.

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