

Prevalence of Vitamin D Deficiency Amongst Pregnant Patients: A Prospective Study

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ABSTRACT

Background: Skeletal health is determined by the level of Vitamin D in body. It also affects the risk of fracture and diseases like osteoporosis and osteomalacia. The present study was aimed at determining the prevalence of Vitamin D deficiency during pregnancy and to determine its association with diet.

Materials and Methods: The present study was done in the Department of Obstetrics and Gynecology, Mahatma Gandhi Hospital, Bhilwara, Rajasthan (India) during a period of 9 months. Patients were made to answer questions regarding the age, education, occupation and obstetric history. Patient's diet history was recorded and they were asked about any additional Iron or calcium intake. Data was recorded in a predesigned Performa and percentages and mean was calculated. Chi square test was used for the comparison of data. Probability value of less than 0.05 was taken as significant.

Results: The study enrolled 120 subjects with the mean age of 29.20 \pm 8.06 years. There were 37.5% females (n=45) who were vegetarian and there were 41.6% females (n=50) who infrequently consumed non vegetarian food. All the females were aged between 20-36 years of age. 75% of the females (n = 90) were Hindus. Few females i.e. 33.3 % (n = 40) had

normal levels of Vitamin D. Maximum females had insufficient levels of Vitamin D. There were 54.2% (=65) in number. Only 12.5% females had deficient level of Vitamin D.

Conclusion: In our study few females i.e. 33.3% (n=40) had normal levels of Vitamin D. Maximum females had insufficient levels of Vitamin D. There were 54.2% (=65) in number. Only 12.5% females had deficient level of Vitamin D.

Keywords: Deficient, Osteomalacia, Prospective, Vitamin.

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INTRODUCTION

Skeletal health is determined by the level of Vitamin D in body. It also affects the risk of fracture and diseases like osteoporosis and osteomalacia.¹ Deficiency of Vitamin D during pregnancy ranges from 18-84% and it depends on country and clothing.²⁻⁶

Various studies have shown that low levels of Vitamin D during pregnancy have been associated with various adverse obstetrical and neonatal consequences.^{7,8}

Levels of Vitamin D can be modified therefore level of Vitamin D should be maintained to optimal levels. Receptors for Vitamin D are present in bone, kidney, muscle, skin and intestine. It has also been found to inhibit parathormone synthesis and promote insulin secretion and innate immunity. It has its role in cellular proliferation and synthesis. Sun rays are the largest and major source of Vitamin D, approximately half an hour exposure to sun's radiation provide us with 50000 IU of Vitamin D.⁹ Presence of melanin decreases the production of cholecalciferol by 90%. Significant changes occur in maternal Vitamin D and calcium levels during pregnancy and lactation. The ideal requirement of vitamin D suggested by some is up to 6000 IU/day.¹⁰

The present study was aimed at determining the prevalence of Vitamin D deficiency during pregnancy and to determine its association with diet.

MATERIALS AND METHODS

The present study was done in the Department of Obstetrics and Gynecology, Mahatma Gandhi Hospital, Bhilwara, Rajasthan (India) during a period of 9 months. This study enrolled 120 patients who were between 28 weeks to 40 weeks of gestation. Patients were made to answer questions regarding the age, education, occupation and obstetric history. Patient's diet history was recorded and they were asked about any additional Iron or calcium intake. All the required blood investigation like MCV, haematocrit and Vitamin D levels were noted. Patients were also asked about complains regarding bone pain, weakness or numbness. Analysis of levels of vitamin D was done. Levels of vitamin D less than 20 ng/ml were taken as deficient, insufficiency was considered if the levels were between 20-30ng/ml and levels of vitamin D more than 30 ng/ml were taken as sufficient.

Table 1: Showing dietary habits

DIET	FREQUENCY	PERCENTAGE
Vegetarian	45	37.5
Infrequent non vegetarian	50	41.6
Frequent non vegetarian	25	20.8
Milk consumption	70	58.3

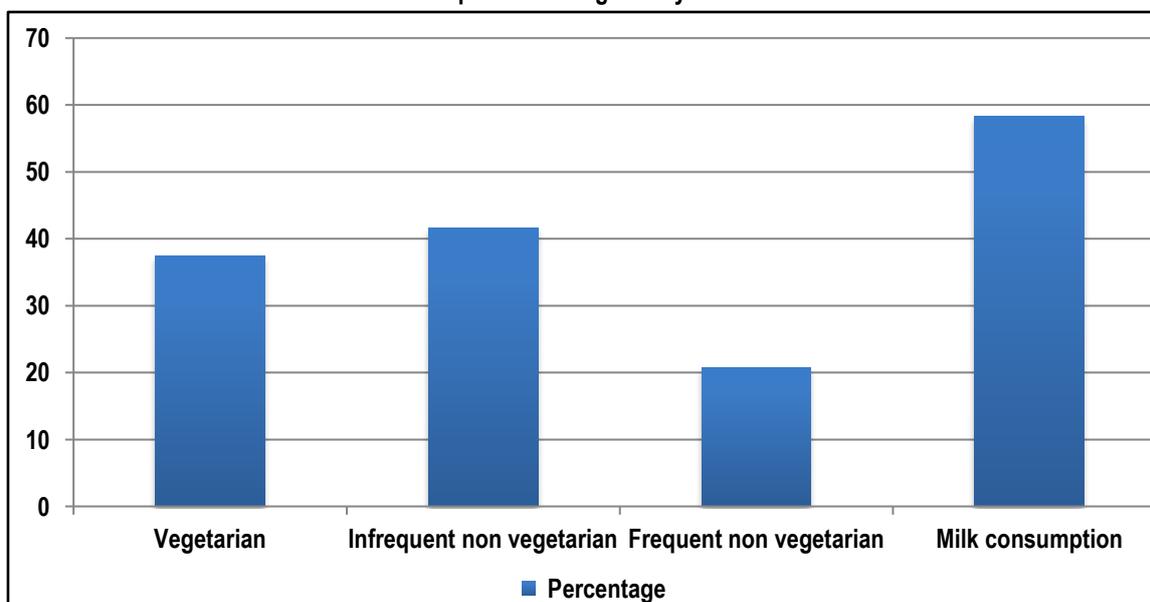
Table 2: Demographic details

DETAIL	FREQUENCY	PERCENTAGE
Age (20-36 years)	120	100
Religion	Hindu	90
	Muslim	22
	Christian	8
Parity	Multi	53
	Primi	67
Gestational age	<32 weeks	0
	32-37 weeks	18
	37 -40 weeks	69
	>40 weeks	13
BMI	Underweight	2
	Normal	66
	Overweight	51
	Obese	1

Table 3: Vitamin D levels amongst patients

VITAMIN D LEVELS	FREQUENCY	PERCENTAGE
Normal	40	33.3
Deficient	15	12.5
Insufficient	65	54.2

Graph 1: Showing dietary habits



RESULTS

Table 1 shows the dietary habits of 120 females. There were 37.5% females (n=45) who were vegetarian and there were 41.6% females (n=50) who infrequently consumed non vegetarian food.

There were 20.8% females (n=25) who frequently consumed non vegetarian food. Table 2 shows that all the females were aged between 20-36 years of age. 75% of the females (n=90) were Hindus. There were 22 females who were Muslim. There were

42.54% patients (n=51) who were overweight. Majority of the females i.e. 55.3% (n=66) were normal. Few females i.e. 33.3% (n=40) had normal levels of Vitamin D. There were 54.2% (n=65) in number. Only 12.5% females had deficient level of Vitamin D.

DISCUSSION

Vitamin D deficiency varies widely across different populations. This variation is due to difference in geographic area, food habits and exposure to sun. In our study there were 12.5% patients (n=15) who were Vitamin D deficient. There were 54.2% patients who had insufficient levels of Vitamin D. In a study conducted by Bodnar et al¹¹ amongst women in Northern United states, they found that 41% of females had deficient Vitamin D and 41% patients had insufficient levels of Vitamin D. Another study conducted by Merewood A et al¹² found that there were 62% of the Caucasian pregnant females and amongst African Americans 96% had deficient or Vitamin D insufficiency during early pregnancy. Variation in the sunlight exposure at different latitudes is responsible for variation in the vitamin D status. A study conducted by Shikata et al¹³ found no significant variation with seasons in the levels of Vitamin D amongst pregnant females. But in another study conducted by Hypponen E et al¹⁴ found that Vitamin D deficiency was more common in winters and springs as compared to other seasons in U.K. Maternal Vitamin D levels are crucial for development of foetal bones.^{15,16} Although association is not very clear, but some studies suggest that development of foetal lungs, immune system is related to maternal Vitamin D. Females deficient of Vitamin D are treated by Vitamin D supplementation. It is safe and effective treatment option for pregnant and lactating mothers. 10 microgram of Vitamin D per day is recommended for all pregnant women.¹⁷ Routine screening of the maternal Vitamin D levels should be done to detect and treat this condition in early pregnancy. If vitamin D pregnancy persists, it can pose a significant threat to maternal and foetal health. Majority of females with low levels of Vitamin D are vegetarian and belong to lower socioeconomic status.

CONCLUSION

Treatment of Vitamin D deficiency should be initiated by supplementation as soon as it is noted. Regular screening of the pregnant patients should be done to prevent any untoward complication to mother and foetus. In our study few females i.e. 33.3% (n=40) had normal levels of Vitamin D. Maximum females had insufficient levels of Vitamin D. There were 54.2% (n=65) in number. Only 12.5% females had deficient level of Vitamin D.

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