

Assessment of Vitamin D Status in Pregnant Women and Non-Pregnant Women

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ABSTRACT

Objective: The objective of this study to evaluate Vitamin D deficiency in pregnant women as compare to non – pregnant women.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynecology KMU-IMS Kohat and Biochemistry of Northwest School of Medicine Peshawar from February, 2018 to August, 2019.

Materials and Methods: We include 200 women in this study in which 100 pregnant women and 100 non-pregnant women as control. Blood samples were collected both groups women and centrifuged at 3000 RPM for 10 min for serum. 25(OH) D was estimated from blood serum of the both groups by automatic chemical Analyzer and for estimation used Merk kits.

Results: Result of both groups pregnant women and non-pregnant women showed that blood serum 25(OH)D of pregnant women is lower as compare to non-pregnant women. In pregnant women we found 16.1 ng/mL serum vitamin as compare to non-pregnant women in which vitamin D value was 20 ng/mL.

Conclusion: The present study demonstrated that in pregnant women high risk of vitamin D deficiency present as compare to non-pregnant women. It is essential that to evaluate vitamin D deficiency in pregnancy and provide vitamin D supplement at early stage.

Key Words: Vitamin D, Pregnant, Non- Pregnant

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INTRODUCTION

Vitamin D is a fat-soluble vitamin approved for its uses in continuing bone condition. Vitamin D levels have also been connected with higher occurrences of various types of cancers.¹⁻³ Vitamin D happens certainly in an inadequate number of foods but is primarily synthesized by UVB light exposure in the skin.⁴ In some countries, which are located in 35°North (and South), Vitamin D is not synthesized in sufficient amount and caused deficiency of Vitamin D.⁵

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Various studies showed that maternal health and fetal development had closely relation with Vitamin D status and it is also said that it has adverse effects on pregnant women and baby it is necessary that vitamin D should be monitor in pregnant women.⁶ Insufficient maternal vitamin D statuses has certainly been associated with pregnancy problems such as preeclampsia and it is also caused infants born small for gestational age and also premature birth.⁷⁻¹⁰ Vitamin D deficiency also caused other type of complication among children such as respiratory tract infections these complications are overcome with vitamin D supplement.¹¹ In different countries studies were conducted to determine the incidence of vitamin D deficiency in pregnant women such as Switzerland. The reasons of deficiency of Vitamin D is unknown.¹² The Objective of the present study to evaluate vitamin D in pregnant women.

MATERIALS AND METHODS

The study was conducted in Department of Obstetrics and Gynecology KMU-IMS Kohat and Biochemistry of Northwest School of Medicine Peshawar. We include 200 women in this study in which 100 pregnant women and 100 non-pregnant women as control. Blood samples were collected both groups women and centrifuged at 3000 RPM for 10 min for serum. 25(OH)D was estimated from blood serum of the both

groups by automatic chemical Analyzer and for estimation used Merk kits. Other biochemical tests were performed for both groups' women such as sugar, lipid profile, Serum creatinine (Cr), blood urea nitrogen (BUN) and uric acid (UA). Statistically analysis by SPSS version 20 software.

RESULTS

In this study, we were selected 200 women for vitamin D estimation in which 100 pregnant women and 100 non-pregnant. Result of both groups pregnant women and non-pregnant women showed that blood serum 25(OH)D of pregnant women is lower as compare to non-pregnant women. In pregnant women we found 16.1 ng/mL serum vitamins as compare to non-pregnant women in which vitamin D value was 20 ng/mL. It was showed that lipid profile is higher in pregnant women as compare to non-pregnant women. The result indicates that all the lipid profile (LDL, Triglyceride) is higher except HDL in women with as compare to normal control women. Total cholesterol (251.5 ± 12.8) mg/dl, LDL (128.8 ± 21.5) mg/dl, and Triglyceride (198.2 ± 32.5) mg/dl.

Table No.1: Participant characteristics

	Pregnant Women (n=100)	Non-Pregnant Women (n=100)
Age (years)	41.53 \pm 10.48	40.55 \pm 10.38
Education		
Basic	B-50%, S-25%, U-25%	B-50%,S-31% U-19%
Secondary		
University		
Body Weight(kg)	69.3 \pm 11.4	71.4 \pm 11.5
BMI (Kg/m ²)	25.4 \pm 2.6	25.3 \pm 2.7

Table No.2: Assessment of Vitamin D in Pregnant women and non- pregnant women

Pregnant women (n=100)	Non- Pregnant women (n=100)
25(OH)D ng/mL	
16.1 \pm 2.1	20.2 \pm 2.3

Table No.3: Biochemical profile of pregnant women and non- pregnant women

Pregnant women (n=100)	Non- women (n=100)
Fasting Blood Glucose(mg/dl)	
97.7 \pm 4.3	98.4 \pm 4.6
Total Cholesterol (mg/dl)	
251.5 \pm 12.8	191.6 \pm 31.5
LDL (mg\dl)	
128.8 \pm 21.5	113.5 \pm 18.3
HDL (mg\dl)	
40.71 \pm 8.5	57.3 \pm 9.1
Triglycerides (mg\dl)	
198.2 \pm 32.5	133.3 \pm 31.2

DISCUSSION

Result of the different studies showed that there have been various problems and complication is attached with vitamin D deficiency. In present study, we study the Vitamin D deficiency in pregnant women and non-pregnant women. Vitamin D is a fat-soluble vitamin approved for its uses in continuing bone condition. Vitamin D levels have also been connected with higher occurrences of various types of cancers. Vitamin D happens certainly in an inadequate number of foods but is primarily synthesized by UVB light exposure in the skin. In some countries, which are located in 35°North (and South), Vitamin D is not synthesized in sufficient amount and caused deficiency of Vitamin D.⁵ Various studies showed that maternal health and fetal development had closely relation with Vitamin D status and it is also said that it has adverse effects on pregnant women and baby it is necessary that vitamin D should be monitor in pregnant women.⁶ Insufficient maternal vitamin D statuses has certainly been associated with pregnancy problems such as preeclampsia and it is also caused infants born small for gestational age and also premature birth. Vitamin D deficiency also caused other type of complication among children such as respiratory tract infections these complications are overcome with vitamin D supplement. In different countries studies were conducted to determine the incidence of vitamin D deficiency in pregnant women such as Switzerland. The reasons of deficiency of Vitamin D are unknown. In European and American studies showed that low level of 25(OH)D concentration has been found in pregnant women.¹³⁻¹⁷ In present study we still found low level of 25(OH)D in pregnant women as compare to control women. Result of both groups pregnant women and non-pregnant women showed that blood serum 25(OH)D of pregnant women is lower as compare to non-pregnant women. In pregnant women we found 16.1 ng/mL serum vitamins as compare to non-pregnant women in which vitamin D value was 20 ng/mL. It was showed that lipid profile is higher in pregnant women as compare to non-pregnant women. The result indicates that all the lipid profile (LDL, Triglyceride) is higher except HDL in women with as compare to normal control women. Total cholesterol (251.5 ± 12.8) mg/dl, LDL (128.8 ± 21.5) mg/dl, and Triglyceride (198.2 ± 32.5) mg/dl. It is believed that vitamin D deposition has been occurred in fat tissue at higher level which caused deficiency vitamin in circulation in blood.¹⁸ In one of study, smoking has enhanced vitamin D deficiency risk in pregnant women. In another study result showed that smoking pregnant women have vitamin D deficiency as compare non-pregnant women¹⁹.

CONCLUSION

The present study demonstrated that in pregnant women high risk of vitamin D deficiency as compare to non-pregnant women. It is essential that to evaluate vitamin

D deficiency in pregnancy and provide vitamin d supplement at early stage.

Author's Contribution:

Concept & Design of Study: Beenish Samreen Hamid
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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Holick MF. Vitamin D: importance in the prevention of cancers, type 1 diabetes, heart disease, and osteoporosis. *Am J Clin Nutr* 2004;79:362–71.
- Garland CF, Garland FC, Gorham ED, Lipkin M, Newmark H, Mohr SB, et al. The role of vitamin D in cancer prevention. *Am J Public Health* 2006;96:252–61.
- Yin L, Raum E, Haug U, Arndt V, Brenner H. Meta-analysis of longitudinal studies: serum vitamin D and prostate cancer risk. *Cancer Epidemiol* 2009;33:435–45.
- Holick MF. *Encyclopedia of human. Nutrition*. 2013. <https://doi.org/10.1016/B978-0-12-375083-9.00276-2>.
- Tsiaras WG, Weinstock MA. Factors influencing vitamin d status. *Acta Derm Venereol* 2011;91:115–24.
- Wagner CL, Hollis BW, Kotsa K, Fakhoury H, Karras SN. Vitamin D administration during pregnancy as prevention for pregnancy, neonatal and postnatal complications. *Rev Endocr Metab Disord* 2017;18:307–22.
- Bodnar LM, Catov JM, Simhan HN, Holick MF, Powers RW, Roberts JM. Maternal vitamin D deficiency increases the risk of preeclampsia. *J Clin Endocrinol Metab* 2007;92:3517–22.
- Achkar M, Dodds L, Giguère Y, Forest J-C, Armson BA, Woolcott C, et al. Vitamin D status in early pregnancy and risk of preeclampsia. *Am J Obstet Gynecol* 2015;212:511.e1–7.
- Zhou SS, Tao YH, Huang K, Zhu BB, Tao FB. Vitamin D and risk of preterm birth: up-to-date meta-analysis of randomized controlled trials and observational studies. *J Obstet Gynaecol Res* 2017;43:247–56.
- De-Regil LM, Palacios C, Lombardo LK, Peña-Rosas JP. Vitamin D supplementation for women during pregnancy. *Cochrane Database Syst Rev* 2016;2016:CD008873.
- Łuczyńska A, Logan C, Nieters A, Elgizouli M, Schöttker B, Brenner H, et al. Cord blood 25(OH)D levels and the subsequent risk of lower respiratorytract infections in early childhood: the Ulm birth cohort. *Eur J Epidemiol* 2014;29:585–94.
- Report, Vitamin D. Vitamin D deficiency: Evidence, safety, and recommendations for the Swiss population Report written by a group of experts on behalf of the Federal Commission for Nutrition (FCN) 2012. *Public Heal Rep Vitam D – FCN Rep*; 2012. p. 1–95.
- Vandevijvere S, Amsalkhir S, Van Oyen H, Moreno-Reyes R. High prevalence of Vitamin D deficiency in pregnant women: a National Cross-Sectional Survey. *PLoS One* 2012;7.
- Soltirovska Salamon A, Benedik E, Bratanic B, Velkavrh M, Rogelj I, Fidler Mis N, et al. Vitamin D status and its determinants in healthy Slovenian pregnant women. *Ann Nutr Metab* 2015;67:96–103.
- Rodriguez A, Santa Marina L, Jimenez AM, Esplugues A, Ballester F, Espada M, et al. Vitamin D status in pregnancy and determinants in a southern European cohort study. *Paediatr Perinat Epidemiol* 2016;30:217–28.
- Brembeck P, Winkvist A, Olausson H. Determinants of vitamin D status in pregnant fair-skinned women in Sweden. *Br J Nutr* 2013;110:856–64.
- Flood-Nichols SK, Tinnemore D, Huang RR, Napolitano PG, Ippolito DL. Vitamin D deficiency in early pregnancy. *PLoS One* 2015;10:e0123763.
- Wortsman J, Matsuoka LY, Chen TC, Lu Z, Holick MF. Decreased bioavailability of vitamin D in obesity. *Am J Clin Nutr* 2000;72:690–3.
- Díaz-Gómez NM, Mendoza C, González-González NL, Barroso F, Jiménez- Sosa A, Domenech E, et al. Maternal smoking and the Vitamin Dparathyroid hormone system during the perinatal period. *J Pediatr* 2007;151:618–23.