CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3234766

Available online at: http://www.iajps.com Research Article

ANALYSIS OF ROLE OF VITAMIN D DEFICIENCY IN FEMALE INFERTILITY: A DESCRIPTIVE STUDY

Sadia Noor Hussain[1], Zarnab Zahra[2], Sana Rafique[3]
[1]Lahore General Hospital Lahore
[2]Jinnah Hospital Lahore
[3]Gynea and Obs Lady Aitchison Hospital Lahore

Article Received: March 2019 **Accepted:** April 2019 **Published:** May 2019

Abstract:
Introduction: *Apart from the well-known effects of vitamin D on maintaining calcium homeostasis and promoting bone mineralization, there is some evidence suggesting that vitamin D also modulates human reproductive processes.* ***Aims and objectives:*** *The main objective of the study is to analyse the role of vitamin D deficiency in female infertility.* ***Material and methods:*** *This cross sectional study was conducted in Lahore general hospital, Lahore during September 2018 to January 2019. This study was done for the analysis of role of vitamin D levels among infertile women. The data was collected from 50 infertile women who visited the OPD of the hospital regularly. Blood was drawn for the analysis of vitamin D levels. Blood was centrifuged at 4000rpm and serum was separated. Serum was further used for the analysis of vitamin D levels.* ***Results:*** *The data was collected from 50 female patients. The mean age was 26.45±5.67 years. All patients were enquired about their profession and 87.50% were nonprofessional (housewife). Our study was done in infertile female's population to see the spectrum of vitamin D levels. Overall, 64.28% infertile females had VDD (up to 10 ng/ml), 30.0% displayed vitamin D insufficiency (10–20 ng/ml), whereas 5.71% of the study population exhibited adequate levels of vitamin D levels (>20 ng/ml). The mean value for vitamin D was 9.30 ± 5.59 ng/ml.* ***Conclusion:*** *It is concluded that the rate of Vitamin D among women with impaired fertility is alarming.*

Corresponding author:
Dr. Sadia Noor Hussain,
Lahore General Hospital Lahore

QR code

Please cite this article in press ***Sadia Noor Hussain*** *et al.,* ***Analysis Of Role Of Vitamin D Deficiency In Female Infertility: A Descriptive Study .,*** *Indo Am. J. P. Sci, 2019; 06(05).*

INTRODUCTION:

Apart from the well-known effects of vitamin D on maintaining calcium homeostasis and promoting bone mineralization, there is some evidence suggesting that vitamin D also modulates human reproductive processes. Vitamin D is a secosteroid hormone mainly produced in the skin after sunlight exposure and is primarily known for its role in bone health and mineralization [1]. In the last few years, the extraskeletal actions of vitamin D have emerged as a significant area of intensive scientific interest. The understanding that vitamin D receptor (VDR) and the enzymes required for the production of the active form of vitamin D are expressed in almost all human cells and tissues has linked vitamin D insufficiency/deficiency to many chronic diseases such as cancer, autoimmune and infectious diseases as well as cardiovascular diseases and diabetes mellitus type [2].

Infertility is a hot topic in the field of public health, affecting about 48.5 million couples worldwide with significant psychological, medical and economic consequences. PCOS and endometriosis comprise the main causes of female infertility, with in vitro fertilization (IVF) offering a solution to this problem [3]. Vitamin D deficiency (VDD) is a major health problem in both the developed and developing countries across the world. Recent epidemiologic studies have shown relationships between low vitamin D levels have harmful effects on various systems and multiple disease states. Vitamin D is also responsible for expression of a large number of genes in reproductive tissues, implicating a role for vitamin D in female reproduction [4]. Human and animal data suggest that low vitamin D status is associated with impaired fertility and endometriosis. Serum 25(OH)D provides the single best assessment of vitamin D status; it has a half-life of about 3 weeks, making it the most suitable indicator of vitamin D status [5].

Vitamin D also inhibits cell proliferation and stimulates cell differentiation. This hormone primarily exerts its effects through the vitamin D receptor (VDR). Through its receptor, vitamin D can modify gene transcription, as well as protein and messenger ribonucleic acid (mRNA) production. In animal studies, dietary VDD leads to a 25% reduction in overall fertility. In various studies, the role of VDD has been correlated with polycystic ovary syndrome (PCOS) and a myriad of pregnancy-related disorders [6].

Aims and objectives

The main objective of the study is to analyse the role of vitamin D deficiency in female infertility.

MATERIAL AND METHODS:

This cross sectional study was conducted in Lahore general hospital, Lahore during September 2018 to January 2019. This study was done for the analysis of role of vitamin D levels among infertile women. The data was collected from 50 infertile women who visited the OPD of the hospital regularly. Blood was drawn for the analysis of vitamin D levels. Blood was centrifuged at 4000rpm and serum was separated. Serum was further used for the analysis of vitamin D levels.

Statistical analysis

The data was collected and analysed using SPSS version 20.0. All the values were expressed in mean and standard deviation.

RESULTS:

The data was collected from 50 female patients. The mean age was 26.45±5.67 years. All patients were enquired about their profession and 87.50% were nonprofessional (housewife). Our study was done in infertile female's population to see the spectrum of vitamin D levels. Overall, 64.28% infertile females had VDD (up to 10 ng/ml), 30.0% displayed vitamin D insufficiency (10–20 ng/ml), whereas 5.71% of the study population exhibited adequate levels of vitamin D levels (>20 ng/ml). The mean value for vitamin D was 9.30 ± 5.59 ng/ml.

Table 01: Vitamin D levels in infertile group

Vit-D levels	Infertile group (ng/ml)	Control group (ng/ml)	p-value
Vitamin-D	6.24 ± 5.59	4.30 ± 7.89	0.004
Antimullerian Hormone	1.30 ± 2.90	3.45 ± 2.59	0.002

DISCUSSION:

Vitamin D is also known as "anti-ricketic factor or sunshine vitamin." Dietary intakes generally has only a minor influence on serum levels outside of the consumption of vitamin D supplements. Even in tropical countries, despite of ample sunlight (required for the synthesis of vitamin D endogenously), VDD is prevalent in range of 50 to 90% among all the age groups. Vitamin D levels did not vary according to age or infertility associated disorders. Another study reported the prevalence of VDD significantly higher in the subfertility group than controls (59.0 versus 40.4%; $P < 0.01$). Only one study reported a positive relationship between vitamin D and serum AMH levels [7].

However, this study admits the significant methodological weakness because of very low numbers of subjects. According to a study, vitamin D supplementation can reduce high AMH production, leading to increase follicular sensitivity to FSH and return to normal ovulation. An observational study reported a insignificant weak negative correlation between serum vitamin D and AMH in young individuals, but a weak possible positive correlation between AMH and vitamin D in women aged 40 years or older [8]. The existing literature does not provide any definitive and consistent pattern for how vitamin D may affect AMH production or serum levels [9]. The key finding in our prospective study in women of child bearing age that serum vitamin D levels appear to be unrelated to AMH levels. Merhi *et al*. had also reported,no relationship between serum vitamin D and AMH levels in women aged 35 to 40 years, with similar results [10,11].

CONCLUSION:

It is concluded that the rate of Vitamin D among women with impaired fertility is alarming. The association for vitamin D intake diminished after adjusting for total energy intake, total dietary and supplement energy adjusted intakes of polyunsaturated fat, iron and folic acid, and dietary quality.

REFERENCES:

1. Rudick B, Ingles S, Chung K, Stanczyk F, Paulson R, Bendikson K. Characterizing the influence of vitamin D levels on IVF outcomes. Hum Reprod. 2012;27:3321–7.
2. Moller UK, Streym S, Heikendorff L, Mosekilde N, Rejnmark L. Effects of 25OHD on chances of pregnancy and pregnancy outcomes: a cohort study in healthy Danish women. Eur J Clin Nutr. 2012;66:862–8.
3. Hossain N, Kanani FH, Ramzan S, Kausar R, Ayaz S, Khanani R, et al. Obstetric and neonatal outcomes of maternal vitamin D supplementation: results of an open-label randomized controlled trial of antenatal vitamin D supplementation in Pakistani women. J Clin Endocrinol Metab. 2014;99:2448–55.
4. 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.
5. Clifton-Bligh RJ, McElduff P, McElduff A. Maternal vitamin D deficiency, ethnicity and gestational diabetes. Diabet Med. 2008;25:678–84.
6. Maghbooli Z, Hossein-Nezhad A, Karimi F, Shafaei AR, Larijani B. Correlation between vitamin D3 deficiency and insulin resistance in pregnancy. Diabetes Metab Res Rev. 2008;24:27–32.
7. Merewood A, Mehta SD, Chen TC, Bauchner H, Holick MF. Association between vitamin D deficiency and primary cesarean section. J Clin Endocrinol Metab. 2009;94:940–5.
8. Shahbazi M, Jeddi-Tehrani M, Zareie M, Salek-Moghaddam A, Akhondi MM, Bahmanpoor M, et al. Expression profiling of vitamin D receptor in placenta, decidua and ovary of pregnant mice. Placenta. 2011:657–64.
9. Zarnani AH, Shahbazi M, Salek-Moghaddam A, Zareie M, Tavakoli M, Ghasemi J, et al. Vitamin D_3receptor expressed in the endometrium of cycling mice throughout the estrous cycle. Fertil Steril. 2010;93:2738–43.
10. Parikh G, Varadinova M, Suwandhi P, Araki T, Rosenwaks Z, Poretsky L, Seto-Young D. Vitamin D regulates steroidgenesis and insulin-like growth factor binding protein-1 (IGFBP-1) production in human ovarian cells. Horm Metab Res. 2010;42:754–757.
11. Blomberg Jensen M, Nielsen JE, Jørgensen A, Rajpert-De Meyts E, Kristensen DM, Jørgensen N, et al. Vitamin D receptor and vitamin D metabolizing enzymes are expressed in the human male reproductive tract. Hum Reprod. 2010;25:1303–11.