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Vitamin D Deficiency in PCOS Affected Sudanese Ladies with Infertility Disorders

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Original Research Article

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Abstract: Vitamin D plays a role with hormones in their receptor sites. Without vitamin D, hormones cannot function the way they would normally. The receptor sites malfunction, leaving estrogen, progesterone, testosterone, luteinizing hormone, and follicle stimulating hormone in the lurch. Without healthy action at receptor sites, hormones don't get utilized. The menstrual cycle fails as a result PCOS results**.** There is no published data about the relationship between vitamin D deficiency and polycystic ovaries syndrome among Sudanese ladies with infertility disorders. To know the association between vitamin D deficiency and polycystic ovaries syndrome among Sudanese ladies with infertility disorders. Descriptive, cross-sectional study, 39 Sudanese ladies with known PCOS and infertility disorders were involved in the study. 71.8% of ladies with polycystic ovaries syndrome were vitamin D deficient. Further studies must be carried out, using large sample size and more than one diagnostic technique.
Keywords: vitamin D, polycystic ovaries syndrome, females' infertility.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a hormonal disorder common among women of reproductive age. Women with PCOS may have infrequent or prolonged menstrual periods or excess male hormone (androgen) levels. The ovaries may develop numerous small collections of fluid (follicles) and fail to regularly release eggs. The exact cause of PCOS is unknown [1].

PCOS affects a woman's ovaries, the reproductive organs that produce estrogen and progesterone — hormones that regulate the menstrual cycle. The ovaries also produce a small amount of male hormones called androgens.

The ovaries release eggs to be fertilized by a man's sperm. The release of an egg each month is called ovulation.

Follicle-stimulating hormone (FSH) and luteinizing hormone (LH) control ovulation. FSH stimulates the ovary to produce a follicle — a sac that contains an egg — and then LH triggers the ovary to release a mature egg.

PCOS is a "syndrome," or group of symptoms that affects the ovaries and ovulation. Its three main features are:

- Cysts in the ovaries
- High levels of male hormones
- Irregular or skipped periods

In PCOS, many small, fluid-filled sacs grow inside the ovaries. The word "polycystic" means "many cysts" [2].

The symptoms of PCOS include excess hair (hirsutism), scalp hair loss, acne, weight gain, difficulties with fertility, increased anxiety and depression and irregular or infrequent periods [3]. PCOS is responsible for 70% of infertility issues in women who have difficulty ovulating [4].

It's important for our health and fertility to make sure we get plenty of nutrients into our bodies, each vitamin and mineral is important in its own right. But vitamin D and fertility have a special connection – many studies have shown that women dealing with infertility often have low levels of this vitamin [5].

Vitamin D plays a role with hormones in their receptor sites. Without vitamin D, hormones cannot function the way they would normally. The receptor sites malfunction, leaving estrogen, progesterone, testosterone, luteinizing hormone, and follicle stimulating hormone in the lurch. Without healthy

action at receptor sites, hormones don't get utilized. The menstrual cycle fails as a result PCOS results. Many other hormone problems and symptoms such as acne, facial hair, low libido, mood disturbances, irregular periods and infertility can result.

A deficiency in vitamin D for women with PCOS is also associated with insulin resistance, obesity, inflammation (elevated levels of C-reactive protein in the blood), low levels of good cholesterol, and high levels of testosterone. It is, in short, associated with cysts on the ovaries, poor metabolic health, and inflammation.

Women who have PCOS are three times more likely to be severely deficient in vitamin D (less than 25 nmol/liter in the blood) than those who do not have PCOS [6].

Study done by Ming-Wei et al showed that; the prevalence of vitamin D Deficiency in women with PCOS is about 67-85% [7].

Rationale

There is no published data about the relationship between vitamin D deficiency and polycystic ovaries syndrome among Sudanese ladies with infertility disorders.

OBJECTIVES

To know the association between vitamin D deficiency and polycystic ovaries syndrome among Sudanese ladies with infertility disorders.

MATERIALS AND METHODS

Study design

Descriptive, cross-sectional study

Study period

March-May, 2018

Study population

Sudanese ladies with known polycystic ovaries syndrome and infertility disorders

Sample size

39 Sudanese ladies with known polycystic ovaries syndrome and infertility disorders

Data collection

Data was collected through well instructed questionnaire; contain all the patient's required information.

Ethical approval

All patients were informed about the objective of the study and they consent to be involved in it.

METHOD

Sample

Venous blood was collected from each participant.

Instrument used to assay vitamin D

VIDAS 25OH Vitamin D total assay (VITD)

Principle

The assay principle combines an enzyme immunoassay competition method with a final fluorescent detection (ELFA).The solid phase Receptacle (SPR) serve as the solid phase as well as the pipetting device for the assay. Reagents for the assay are ready-to-use and pre –dispensed in the sealed reagent strips.

All of the assay steps are performed automatically by the instrument. The reaction medium cycled in and out of the SPR Several times. The sample is mixed with pre-treatment reagent to separate vitamin D from its binding protein.

The pre-treated sample is then collected and transferred into the well that contains an alkaline phosphatase (ALP) labeled anti-vitamin D antibody (conjugate).

The vitamin D antigen present in the sample and the vitamin D antigen coating the anterior of the SPR complete for binding sites on the anti-vitamin D antibody-ALP conjugate.

During the final detection step, the substrate (4-Methyl-umbelliferyl phosphate) is cycled in and out of the SPR.

The conjugate enzyme catalyzes the hydrolysis of this substrate into a fluorescent product (4-Methyl-umbelliferone), the fluorescence of which is measured at 450 nm. The intensity of the fluorescence is inversely proportional to the concentration of vitamin D antigen present in the sample. At the end of the assay, results are present in the sample. At the end of the assay, results are automatically calculated by the instrument in relation to the calibration curve stored in memory, then printed out.

RESULTS

71.8% of ladies with polycystic ovaries syndrome were vitamin D deficient.

DISCUSSION

Our result showed that more than 70% of ladies with PCOS and infertility disorders were vitamin D deficient. This may confirm why PCOS is responsible for 70% of infertility issues in women who have difficulty ovulating.

CONCLUSION

Further studies must be carried out, using large sample size and more than one diagnostic technique.

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