

6th International Congress on

Gynecology & Gynecologic Oncology

July 23-24, 2018 | Rome, Italy

Role of Vitamin D deficiency in female infertility and ART outcomes

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Background: The prevalence of vitamin D deficiency in Saudi Arabia is 35%. In spite of adequate sunlight exposure 90 % cases are due to dietary insufficiency. Vitamin D is an emerging factor influencing female fertility and ART outcome. Hence additional studies are pressing needed to confirm a causal relationship and to investigate the potential therapeutic benefits of vitamin D supplementation [20].

Aim: To assess the role of vitamin D deficiency and perceive the outcomes of ART among vitamin D deficient females in infertile females attending infertility clinic in Riyadh Saudi Arabia.

Methods: A retrospective cohort study of all vitamin D deficient infertile women who presented to Reproductive endocrinology and infertility department (REIMD), King Fahd Medical City infertility center from January 2012 and January 2016 for a period of 4 years was performed. Random sampling was done to take around 192 infertile females who fulfill the inclusion criteria for the study. The association of vitamin D deficiency in infertile females between deficient and insufficient groups was distinguished followed by analysis of the outcome (aborted, ectopic pregnancy, molar pregnancy, no pregnancy, successful pregnancy and unknown) after the intervention done in the form of different ART options (OI, IUI, IVF, ICSI). IRB approval was taken from the institutional review board of King Fahad Medical City. (15-452).

Results: Among 192 patients in total, 56.2% had primary infertility, 36.5% had an irregular menstrual cycle, 33.3% had PCOS, 78.1% underwent IVF, and successful pregnancy was observed in only 15.1%. Of the included women, 88.5% were vitamin D deficient, (less than 50nmol/l) and 5.2% were vitamin D insufficient (50-75nmol/l). In infertile women with low vitamin D, there was also decrease in the level of FSH and LH. When vitamin D deficient (<50nmol/l) and vitamin D insufficient groups (50-75nmol/l) were compared the maximum duration of infertility among vitamin D deficient (29.4%), and vitamin D insufficient (40%) was six years. Though vitamin D deficient patients had primary infertility (57.6%), Vitamin D insufficient patients had secondary infertility (50%). Almost 37.6% of vitamin D deficient and 30% of vitamin D insufficient groups had an irregular menstrual cycle. Most common ultrasound manifestation in vitamin D deficient (33.5%) and vitamin D insufficient cases (40%) was PCOS. 80.6% of vitamin D deficient patients underwent IVF compared to 40% of vitamin D insufficient patients with statistical significance less than 0.05 (p value=0.008). Pregnancy with IVF was observed in 21.8% of vitamin D deficient and 10% of vitamin D insufficient patients with statistical significance less than 0.05 (p value=0.009). As for the outcome, no pregnancy was observed in 62.3% vitamin D deficient and 40% of vitamin D insufficient patients. Successful pregnancy was confirmed in 15.3% of vitamin D deficient and 20% in vitamin D insufficient cases.

Conclusion: Both vitamin D deficiency, as well as insufficiency, adversely affect the outcome of ART contributing to lower pregnancy rates among Arabian women in the reproductive age group. Vitamin D supplementation might bring on treatment success in infertile patients undergoing IVF and is recommended for infertile women in our region.

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