ORIGINAL RESEARCH

Assessment of role of vitamin D supplementation among PCOS women with vitamin D deficiency

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ABSTRACT

Background: PCOS, or polycystic ovarian syndrome, is the most prevalent endocrine condition, which affects women in their reproductive years and has a 6–10% frequency in the general population. The present study was conducted to assess role of vitamin d supplementation among PCOS women with vitamin D deficiency.

Materials & Methods:94 women diagnosed with PCOS with Vitamin Ddeficiency were divided in to two groups of 47 women in each group. Group I women were given treatment with Metformin &calcium 1000mg daily along with Vitamin D3 60K IU weekly for 6weeks followed by monthly for 4 months. Group II women were given treatment with Metformin 1000mg daily only. Menstrual cycles, hyperandrogenic symptoms like hirsutism & acne, history of features of PCOS was done before starting treatment.

Results: age group 16-20 years comprised of 4 patients and 7 patients, 21-25 years had 18 and 17, 26-30 years had 20 and 16 and 31-35 years had 5 and 7 patients in group I and II respectively. The difference was non- significant (P>0.05). Vitamin D (ng/ml) before treatment was 12.1 and 13.2 and after treatment was 12.9 and 13.8 in group I and II respectively. BMI (Kg/m2) before treatment was 26.4 and 25.1 and after treatment was 24.2 and 24.7 in group I and II respectively. Waist hip ratio before treatment was 0.84 and 0.83 and after treatment was 0.82 and 0.81 in group I and II respectively. Hirsutism before treatment was 13.7 and 13.5 and after treatment was 9.7 and 11.4 in group I and II respectively. Ovarian volume (cm3) before treatment was 8.9 and 8.5 and after treatment was 6.3 and 7.2 in group I and II respectively. The difference was non- significant (P> 0.05).

Conclusion: Calcium and vitamin D are safe medications with few side effects; thus it is advised for ladies, particularly those who are deficient in vitamin D.

Keywords: Calcium, vitamin D

INTRODUCTION

PCOS, or polycystic ovarian syndrome, is the most prevalent endocrine condition, which affects women in their reproductive years and has a 6–10% frequency in the general population.[1] PCOS is defined by the following: i) polycystic ovarian morphology; ii) hyperandrogenism and/or hirsutism; and iii) ovulatory dysfunction leading to oligo-and/or anovulation.[2]

Increased ovarian and adrenal androgen secretion, hyperandrogenic symptoms such as hirsutism, acne, alopecia, irregular menstruation, and polycystic ovaries with increased ovarian volume and stromal thickness are the hallmarks of PCOS.[3] PCOS is linked to a number of risk factors, including dyslipidemia, insulin resistance, insulin resistance, central obesity, subclinical atherosclerosis, hypertension, impaired glucose tolerance, type 2 diabetes, metabolic syndrome, endometrial hyperplasia, and endometrial and ovarian malignancies. It is crucial to identify the illness early and treat it.[4]

It has been suggested recently that vitamin D insufficiency could be the missing link between PCOS and IR.[5] The discovery that the active vitamin D–vitamin D receptor (VDR) complex regulates over 300 genes, including those crucial for blood pressure regulation, glucose and lipid metabolism, and both, lends credence to this theory. Moreover, in individuals with type 2 diabetes mellitus, there is a correlation between low vitamin D level and IR.[6]The present study was conducted to assess role of vitamin d supplementation among PCOS women with vitamin D deficiency.

MATERIALS & METHODS

The present study was conductedin Department of Gynecological Oncology, IGIMS, Patna, Bihar, India

during September 2018 to August 2022 on94 women diagnosed with PCOS with Vitamin Ddeficiency. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided in to two groups of 47 women in each group. Group I women were given treatment with Metformin &calcium 1000mg daily along with Vitamin D3 60K IU weekly for 6weeks followed by monthly for 4 months. Group II women were given treatment with Metformin 1000mg daily only. Detailed history regarding chief complaints, menstrual cycles, hyperandrogenic symptoms like hirsutism & acne, history of features of PCOS in the family was taken. Complete physical examination, laboratory tests like serum total testosterone, serum fasting insulin for hyperandrogenism & IR respectively &transabdominal ultrasound scan for ovarian volume was done before starting treatment. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table: I Distribution of patients

Age group (years)	Group I	Group II	P value
16-20	4	7	0.31
21-25	18	17	
26-30	20	16	
31-35	5	7	

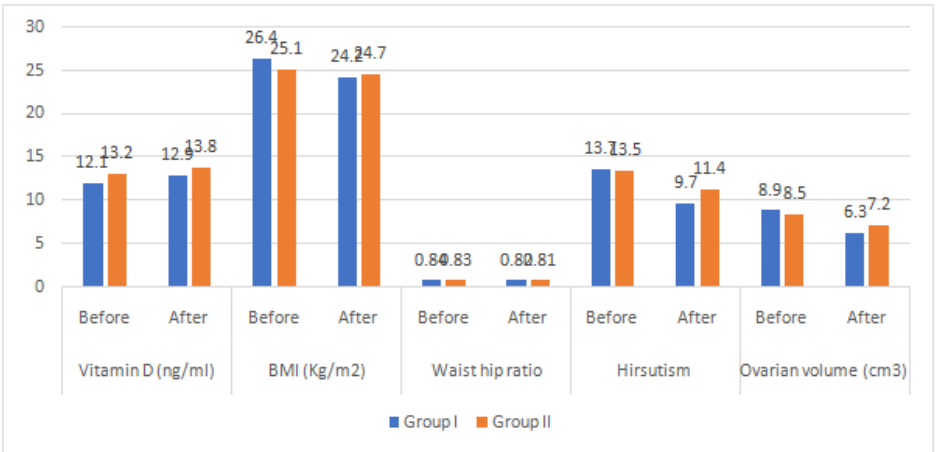
Table I shows that age group 16-20 years comprised of 4 patients and 7 patients, 21-25 years had 18 and 17, 26-30 years had 20 and 16 and 31-35 years had 5 and 7 patients in group I and II respectively. The difference was non- significant (P>0.05).

Table: II Assessment of parameters

Parameters	Variables	Group I	Group II	P value
Vitamin D (ng/ml)	Before	12.1	13.2	0.01
	After	12.9	13.8	
BMI (Kg/m2)	Before	26.4	25.1	0.75
	After	24.2	24.7	
Waist hip ratio	Before	0.84	0.83	0.68
	After	0.82	0.81	
Hirsutism	Before	13.7	13.5	0.07
	After	9.7	11.4	
Ovarian volume (cm3)	Before	8.9	8.5	0.15
	After	6.3	7.2	

Table II shows that vitamin D (ng/ml) before treatment was 12.1 and 13.2 and after treatment was 12.9 and 13.8 in group I and II respectively. BMI (Kg/m2) before treatment was 26.4 and 25.1 and after treatment was 24.2 and 24.7 in group I and II respectively. Waist hip ratio before treatment was 0.84 and 0.83 and after treatment was 0.82 and 0.81 in group I and II respectively. Hirsutism before treatment was 13.7 and 13.5 and after treatment was 9.7 and 11.4 in group I and II respectively. Ovarian volume (cm3) before treatment was 8.9 and 8.5 and after treatment was 6.3 and 7.2 in group I and II respectively. The difference was non- significant (P> 0.05).

Graph: I Assessment of parameters



DISCUSSION

Regardless of BMI, women with PCOS exhibited higher levels of LDL and non- HDL cholesterol.[7] According to available data, IR plays a major part in the pathophysiology of PCOS by causing problems with metabolism and reproduction.[8,9] A great deal of research has been done to understand the process underlying metabolic abnormalities, namely insulin resistance (IR), in women with PCOS. Obesity may contribute to IR to some extent. Nonetheless, IR is also present in a sizable portion of thin PCOS-affected women, even in the absence of obesity.[10,11]The present study was conducted to assess role of vitamin d supplementation among PCOS women with vitamin D deficiency. We found that age group 16-20 years comprised of 4 patients and 7 patients, 21-25 years had 18 and 17, 26-30 years had 20 and 16 and 31-35 years had 5 and 7 patients in group I and II respectively. Gunapati et al[12] found that in terms of mean age, BMI, waist-hip ratio, percentage of women with acne and hirsutism, irregular menstruation, mean ovarian volume, mean serum total testosterone, and mean serum fasting insulin prior to therapy, the cases in both groups are well matched. Throughout the course of the medication, women were monitored, and at the 6-month mark, they underwent another clinical examination and investigation to look for any improvements in the numerous PCOS features that were taken into consideration. After treatment, 78% of group A receiving metformin, calcium, and vitamin D supplements had regular menstrual periods ($p = 0.0001$), compared to only 56% of group B receiving metformin supplementation. When comparing the two groups, it was discovered that supplementing metformin with calcium and vitamin D greatly regularized the menstrual periods ($p = 0.031$). After therapy for six months, there was a reduction in mean values for BMI, waist hip ratio, acne, hirsutism, and serum fasting insulin in both groups; however, group A women (who received vitamin D, calcium, and metformin) saw a greater reduction than group B women (who received metformin). However, these variations lacked statistical significance. Menstrual irregularities and dysregulated bodily processes are brought on by differences in calcium and vitamin D levels, which also contribute to a state of meiotic arrest and aberrant oocyte development in the ovary in PCOS.

We found that vitamin D (ng/ml) before treatment was 12.1 and 13.2 and after treatment was 12.9 and 13.8 in group I and II respectively. BMI (Kg/m2) before treatment was 26.4 and 25.1 and after treatment was 24.2 and 24.7 in group I and II respectively. Waist hip ratio before treatment was 0.84 and 0.83 and after treatment was 0.82 and 0.81 in group I and II respectively. Hirsutism before treatment was 13.7 and 13.5 and after treatment was 9.7 and 11.4 in group I and II respectively. Ovarian volume (cm3) before treatment was 8.9 and 8.5 and after treatment was 6.3 and 7.2 in group I and II respectively. Sachdeva et al[13]estimated vitamin D3 levels in patients of polycystic ovarian disease and compared it with non PCOS females and to study correlation between Vitamin D3 levels and polycystic ovarian syndrome. The mean vitamin D value of cases was 14.57±6.86 ng/ml and that in controls was 29.31±6.53 ng/ml. When we compared the mean vitamin D value of both the groups, there was statistically significant difference found between the two groups. They found significant negative correlation found between vitamin D value with age and BMI.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that calcium and vitamin D are safe medications with few side effects, thus it is advised for ladies, particularly those who are deficient in vitamin D.

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