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To Study the Levels of Serum Vitamin D in Polycystic Ovary Syndrome

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Abstract: ***The aim of study was to measure serum level of Vitamin D in Polycystic ovary syndrome(PCOS)and compare with healthy control subjects. In this study 85 PCOS and 85 healthy subjects (age and gender matched) were enrolled. BMI and Vitamin D were assessed. Serum Vitamin D levels were lower in PCOS subjects compared with healthy controls (13.9 ± 5.2 ng/ml vs 28.7 ± 8.5ng/ml, respectively, P<0.0001). decreased serum levels Vitamin D in PCOS other than healthy subject.***

Keywords: Vitamin D, PCOS

1. Introduction

Polycystic ovary syndrome (PCOS) is a common endocrine disorder in females, especially in women of reproductive age. PCOS could be diagnosed by infertility, acne, amenorrhea or oligomenorrhea, hirsutism, insulin resistance, obesity, hyperandrogenism, and polycystic ovaries by ultrasonography. Association of PCOS with infertility is well studied and is thought to be responsible for 40% of female infertility [Muhammad Jaseem Khan et al. 2019]. Excess luteinizing hormone (LH) and low follicle stimulating hormone (FSH) are also common in PCOS. Irregular or absence of menstrual cycle, increased levels of male hormones.

It has been suggested that vitamin D depletion plays a potential role in increasing IR and metabolic abnormalities and in disrupting ovarian folliculogenesis and hormonal secretion in PCOS patients, and it is therefore essential to screen vitamin D status among all the PCOS patients. Though vitamin D is known for its primary role in bone and mineral homeostasis. With increasing data of low level of vitamin D prevalence in general population across India and with growing urbanisation, number of studies have demonstrated associations between vitamin D levels and various PCOS symptoms, including insulin resistance, infertility and hirsutism [Hahn et al.2006,Yildizhan et.al.2009, Pal L et al.2008]. Evidence suggests that Vitamin D levels are similar in women with and without PCOS [Panidis D et al. 2005, Li H.W.R. et al. 2011] however, there have been reports of lower levels[Wehr E.et al. 2009, Mazloomi S.et al. 2012, Lerchbaum E.et al. 2012] and higher levels[Mahmoudi T.et al. 2010] seen in women with PCOS.

Although there are many evidences linking serum Vitamin D and PCOS. Data about serum Vitamin D concentration in PCOS is limited. Therefore, present study was undertaken to evaluate serum Vitamin D levels in patients with PCOS and to compare it with healthy controls.

2. Materials & Methods

The present study has been conducted on 85 diagnosed PCOS patients (According to Rotterdam PCOS Consensus Criteria) admitted or attending out-patient department of Janana Hospital, Ajmer. 85 healthy subjects of similar age group and BMI has been included in the study as control group. Anthropometric parameters and other variables i.e. Age, Weight, Height, Body mass index (BMI), Serum Calcium, Serum PTH and Vitamin D were measured. Venous blood sample was collected by aseptic technique and serum samples were separated into labelled tubes. Serum samples were kept freezed until assayed. Blood samples were obtained during the early follicular phase of menstrual cycle after at least 10 hours of fasting.

3. Results and Observation

In this study, 85 cases of PCOS were compared with 85 healthy controls.

Table 1: Anthropometric parameters of PCOS subjects & Healthy controls

Parameters	PCOS Cases (Mean ± SD)	Healthy Controls (Mean ± SD)
AGE (yrs)	31.60 ± 6.4	30.4 ± 5.2
WEIGHT (kg)	69 ± 19	71 ± 17
HEIGHT (cm)	160 ± 1.7	170 ± 1.6
BMI (kg/m2)	26.7 ± 6.6	24.4 ± 6.6

Table 2: Biochemical parameters of PCOS subjects & Healthy subjects

Parameters	PCOS Cases (Mean ± SD)	Healthy Controls (Mean ± SD)	P-Value
Serum Vitamin D (ng/ml)	13.9 ± 5.2	28.7 ± 8.5	<0.0001 (HS)
Serum Calcium (mg/dl)	9.18 ± 0.29	9.03 ±0.30	<0.001
Serum PTH (pg/ml)	24.55 ± 10.64	17.45 ± 7.55	<0.0001 (HS)

P value <0.0001 is considered highly significant while p<0.01 is considered significant

Basic anthropometric parameters of PCOS subjects and healthy subjects are summarized in table-1. There was no significant difference between PCOS subjects and healthy subjects regarding mean age (31.60 ± 6.4 vs 30.4 ± 5.2. yrs). BMI mean ± SD in kg/m^2 in PCOS and healthy subjects was (26.7 ± 6.6 vs. 24.4 ± 6.6) and it was highly significant. Biochemical parameters of PCOS subjects and healthy subjects are presented in table-2. PCOS subjects had lower Vitamin D levels compared to healthy subjects (13.9 ± 5.2 ng/ml vs 28.7 ± 8.5ng/ml, P<0.0001).

4. Discussion

In the present study,PCOS subjects have significantly lower levels of Vitamin D as compared to healthy control subjects. A number of articles have reported decreased levels of serum Vitamin D in PCOS but PCOS subjects have not been studied extensively to know whether the decrease in the circulating Vitamin D levels begin before the onset of PCOS. Our result was consistent with previous research which claimed the tendency of decreasing of vitamin D levels in PCOS women. Wehr et al. previously found a deficiency of vitamin D in women with PCOS [E. Wehr et al. 2009]. Several studies have reported that low vitamin D levels in women with PCOS, with average of 25(OH)D levels between 11 and 31 ng/ml, with the most were <20 ng/ml (67-85%) [R. L. Thomson et al. 2012].Results of this study suggest that serum levels of Vitamin D are decreased in patients with PCOS.

5. Limitations of Study

Our sample size was relatively small.

6. Acknowledgements

NIL

7. Conflicts of Interest

We have no competing interests.

8. Funding

NIL

9. Conclusion

From the present study it is concluded that serum Vitamin D levels gets decreased prior to onset of PCOS. Moreover the relation between the Vitamin D and both metabolic and hormonal changes may act as a major player in the link between the metabolic syndrome and the PCOS. It could be considered among therapeutic agents used in the prevention of PCOS and in the prevention or reduction of its critical complications.

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