POLYCYSTIC OVARIAN SYNDROME:A RELATIONSHIP OF BODY MASS INDEX AND ITS CLINICAL MANIFESTATIONS

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ABSTRACT

Objective: To evaluate the relationship between Body Mass index (BMI), Polycystic Ovarian Syndrome (PCOS) and its clinical presentation.

Study design: Case and control study.

Place and Duration of Study: The study was conducted in Gynecology and Obstetrics department of D.S.Hospital, Palani .from2015 to 2017.

Materials and Methods: Married females (n=25) of 19-38 years were enrolled with their written consent in this study., 25 apparently healthy females and 25 diagnosed patients of polycystic ovarian syndrome selected according to Rotterdam criteria. Medical causes including cushing syndrome, androgen secreting tumor, thyroid disorders, prolactinemia.

Results: Data was collected on pre-designed questionnaire for age, genetic history of PCOS, age of menarche, history of any medical disorders and medication.

The Data was subjected to SPSS version 21 and analyzed using independent T-test and chi square test.

Results: 100% of patients suffering from PCOS were obese or overweight. Distribution of clinical symptoms was higher in obese patients as compared to normal weight patients.

Conclusion: There is significant relationship between obesity, PCOS and distribution of clinical symptoms in ladies of reproductive age. So ladies of this age group should have normal weight.

Keywords: Body Mass Index, Polycystic Ovarian Syndrome.

Introduction

Polycystic ovarian syndrome (PCOS) is the commonest endocrine system disorder among females in their reproductive age presented by menstrual dysfunction, insulin resistance, hyperandrogenism and polycystic ovaries can lead to depression, social and marital crises and sexual dysfunction[1, 2] majority of patients with PCOS have overweight or obesity. It has been well established that obesity worsens the phenotype of PCOS. Lifestyle interventions and weight-loss improve body composition and insulin resistance in patients with PCOS[3]. Now a days, it is considered as a common, genetic disorder affecting women throughout their reproductive life. Rate of prevalence is difficult to define and depends on the used definition and also depends on the ethnicity of the population to be measured. Most studies have shown the prevalence between 6–15% but it may high up to 20%, depending on used criteria[4,5]. Study among Asian people showed the prevalence of PCOS about 6.3% among females in their reproductive age (18-45 years) in Sri Lanka, 2-7.5% in females of China by using Rotterdam criteria[5]. A study from Pakistan in 2005 reported a prevalence of PCOS about 20.7% in females[6]. The underlying defect in PCOS is not clear yet however some factors including insulin resistance, obesity, genetic, environmental, endocrine and metabolic factors may play a role in the development of PCOS[7].

According to the 2003 Rotterdam diagnostic criteria for polycystic ovary syndrome, presence of any two features out of three polycystic ovarian (PCO) morphology on ultrasound scan, clinical and biochemical hyperandrogenism and oligo-amenorrhoea) are the diagnostic tool for declaring polycystic ovary syndrome[8]. The prevalence of PCOS by Rotterdam criteria showed variation in different age groups such as 83-84% between ages 18-22 years, 66-84% present in 23-27 years females, about 42-79% females presented with PCOS in 28-32 years of age, 19-33% PCOS in 33-37 years and 0-33% in 38-40 years age group[9]. Obesity being leading cause of infertility, decreases chance of spontaneous conception in normal ovulatory women by 5% for each unit rise in body mass index (BMI). With increasing body mass index the ovarian volume, uterine area and endometrial thickness increases. However the follicular count and follicular size are reduced with higher BMI.

According to World Health Organization (WHO) estimates, 26 % of women in Pakistan are obese[10]. We conducted this study to create awareness about importance of proper weight and hazards of obesity amongst women of reproductive age having PCOS.

Materials and Methods

A case and control study was conducted in Gynecology and Obstetrics D.S.Hospital, Palani. over a period of 6 months after obtaining approval for research proposal. Married females (n=50) of 18-45 years were enrolled from OPD of Gynecology and Obstetrics department.D.S.Hospital, Palani, with their written consent after explaining the purpose of study. These females were divided into two groups, 25 apparently healthy females had normal weight and normal menstrual cycles. None of them had clinical symptoms of hyperandrogenism and 25 newly diagnosed patient of polycystic ovarian syndrome selected according to Rotterdam criteria.

Accordingly, the presence of two features out of three i.e. polycystic ovarian (PCO) morphology on ultrasound scan (presence of 12 or more follicles measuring 2-9 mm in diameter per ovary or ovarian volume above 10cc), clinical/biochemical hyperandrogenism (hirsutism, acne or alopecia and /or elevated androgens levels) and ovulatory dysfunction (oligomenorrhea or amenorrhea) were existed. The females taking drugs(oral contraceptive, hypoglycemic drugs, vitamin D supplementation) and with other medical causes including Cushing syndrome, androgen secreting tumor, thyroid disorders, and prolectinemia were excluded from the research. Ferriman-Gallwey scoring system was used to evaluate the hair growth at seven sites: upper lip, chin/face, chest, back, abdomen, arms and thighs. A score above 8 was indicative of hirsutism. Body weight in kilogram and height in meters was measured and BMI was calculated as weight (kg) divided by the square of the height (m). Subjects were categorized as normal weight (BMI between 19.5 to 25), overweight (BMI between 25 to 29.9) and obese (BMI > 30)[10] Non-probability purposive sampling technique was done. Statistical analysis was done in SPSS version 21.0. Results were compared by applying independent T test and Chi-square. The level of significance was set as P< 0.05).

Table - 1: Distribution of BMI in Controls and PCOS patients.

GROUP	BMI	FREQENCES	PERCENTAGE
	Normal weight	25	100
CONTROL	Over weight	0	0
	Obese	0	0
	Normal weight	8	32
PCOS	Over weight	12	48
	Obese	5	20

Table-2

Comparison of mean BMI in control group and PCOS patients

	GROUP	NUMBER	MEAN	S.D	P-VALUE
BMI	Control	25	21.1	2.81	<0.001
	PCOS	25	28.56	2.75	Significant

Table-3

Distribution of clinical symptoms in PCOS patients

SYMPTOMS	FREQUENCY	NORMAL WEIGHT	OVER WEIGHT	OBESE	PERSENTAGE
Oligomenorrhea	5	5	-	-	10
Hirsutism	21	13	5	3	42
Amenorrhea	6	5	-	1	12
Menstruation-IR	13	2	8	2	26
Menstruation-R	16	8	7	1	32
Acne	3	2	-	-	6
Alopecia	3	2	-	1	6
Polymenorrhea	4	2	1	1	8

Results

According to the results it was found that there is significant (p-value <0.05) difference in BMI of both groups. The mean BMI in PCOS patients (28.56±4.396) is significantly (p-value < 0.05) greater in comparison to control group (21.1±3.452) (Table-II). Majority of PCOS subjects have oligomenorrhea (10%), hirsutism (42%), polymenorrhea and irregular menstruation (34%), acne (6%), alopecia (6%) and amenorrhea (12%) (Table III). The relationship of symptoms distribution was that maximum incidence (10%)

oligomenorrhea was in20% obese group 48 % in over weight and only 32% in normal weight group. Hirsutism 12 % in obese 23.8% in over weight pateints polymenorrhea, irregular menstruation, acne, alopecia and amenorrhea maximum distribution is in obese group (table III).

Discussion

Obesity is one of the leading health problems now a days. It is conveniently quantified by using BMI. PCOS is one of the common outcomes arising from obesity. Rise in Body Mass Index (BMI) is associated with decrease in conception rate. There is also increased endometrial thickness whereas follicular count and follicular size is reduced. Different studies explain the relationship between obesity and different clinical symptoms of PCOS.

The findings of the present study have shown a strong correlation between increased BMI and incidence of PCOS. It has also highlighted that overweight/obese women with PCOS have significantly increase distribution of symptoms of hyperandrogenism and oligmenorrhea. In present study 100 % of PCO patients were overweight /obese (table-1), this ratio was only 32 % in control group. Comparison of mean BMI in control group and PCOS patients showed a significant increase (P>0.001) (Table II) Frequency of oligmenorrea, hirsutism and menstrual irregularities was maximum in obese patients (Table III). Several studies have supported that higher BMI indicate a greater incidence of PCOS. Wijeyaratne et al. (2014)[11] showed in his study that those with PCOS had significantly higher BMI. 69.2% of overweight/obese patients had polycystic ovary morphology.

This result is higher than what is reported by Pasquali et al who showed that about 35% of the women with PCOS were overweight or obese or respectively (Pasquali, Vicennati, & Gambineri, 2007)[12]. Hirsutism is a good marker for hyperandrogenism especially when present in obese patients. In the present study, hirsutisms have shown in more than 42% of PCOS women.

Wijeyaratne PCOS patients study reported 74.6% had significant hirsutism, Acne was present in 39.2% patients.11 Kiddy et al. (1990) found that there was increased frequency of hirsutism in obese compared with lean PCOS women whereas all overweight / obese patients had suffered from abnormally excessive hair growth[13]. Dinka et al reported that no significant association was shown between the hirsutism grade, BMI and hormonal parameters examination[14,15]. Muryum ghanbari,reze ghadimi in their study concluded that the overweight/obese women with PCOS were at an increased risk of sonographic view of

polycystic ovaries[16]. In addition ratio of oligmenorrea was 80% hirsutism 46% and acne 30%. In our study oligomenorrhea was present in 10% and acne was 6%. Difference in frequency of oligmenorrea, hirsutism and acne in different studies as compared to our study may be due to difference in diet, atmospheric conditions, socioeconomic status and level of exertion of our patients[17]. it has proved that age ≥35 years, BMI ≥25 kg/m2 and acne are as significant predictors of metabolic disorder in PCOS women[18].

Conclusion

This study has shown a significant relationship between obesity and PCOS and distribution of clinical symptoms in ladies of reproductive age. It emphasizes upon importance of normal body weight and guides that successful weight reduction is the most effective method of restoring normal ovulation and menstruation and this should be used a major advice in obese PCOS patients.

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