Original Research Article

A correlation of clinical, hormonal and ultrasonography features of polycystic ovarian syndrome among adolescent and reproductive age group women attending OPD in Navodaya medical college

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ABSTRACT

Background: Polycystic ovarian syndrome is the most common complex endocrine disorder in women of reproductive age. It is characterized by an array of clinical, endocrinal and metabolic manifestation. Aim of this study was to examine the correlation between clinical, hormonal and ultrasonography features in women diagnosed as polycystic ovarian syndrome.
Methods: A cross sectional study of 100 reproductive age group women who had irregular cycles and polycystic ovarian morphology on ultrasound. Data about the menstrual history and anthropometric measurements were collected. Clinical observations were like hirsutism and acanthosis nigricans was noted.
Results: In all 100 PCOS women were studied and analysed. The mean age was 24.27(±5.64), mean BMI was 26(±4.8). Among the PCOS women 82% had oligo menorrhoea, 38% had hirsutism and LH:FSH ratio deranged in 37% cases. The association between women having oligomenorrhoea and obesity with PCO morphology on scan was statistically significant.
Conclusions: Young women who are diagnosed as dysregulated PCO are at a high risk to develop PCOD and long term sequel such as diabetes, hypertension and infertility. Lifestyle modification is advisable for managing symptoms and preventing long term complications and have a quality life.

Keywords: Hirsutism, Polycystic ovarian syndrome, Obesity, Oligomenorrhoea

INTRODUCTION

Polycystic ovarian syndrome is a most common heterogeneous multisystem endocrinological disorder of reproductive age, affecting 5-10% of women worldwide. PCOS set early in adolescent life, but clinically manifest in reproductive age with long term implications of diabetes hypertension, dyslipidemia, cardiovascular disease which forms syndrome X.[1] Globally, the prevalence of PCOS ranges from 2.2% to 26% among reproductive age group.The prevalence of PCOS varies from 3% to 11%

depending on the diagnostic criteria used and the population studied.[2]

Classically PCOS is characterized by abnormal menses from puberty with acne and hirsutism arising in teens. Incidence of infertility in PCOS is 75%. It is mainly due to anovulation. Genes associated with a susceptibility to anovulation and polycystic ovaries have focused on genes relating to the insulin receptor and substrates and genes encoding the cytochrome p 450 C17 alpha dysregulation, the androgen forming enzyme in both the adrenals and the

ovaries. The development of PCOS has been linked to hereditary and environmental factors including genetics, insulin resistance, obesity and birth weight.[3]

Stein and Leventhal in 1935 first described the association amenorrhea with obesity and bilateral enlarged cystic ovaries showing a typical histological appearance of thickened capsule, multiple cysts and dense hypertrophied interstitial tissue.[4]

Rotterdam criteria where two of the following three criteria were required in order to diagnose the condition, after exclusion of other causes of androgen excess which includes oligo and/or anovulation, clinical and/or biochemical signs of hyperandrogenism and PCOM on ultrasound scan.

The sonographic criteria for PCOS morphology requires the presence of 12 or more follicles in either ovary measuring 2-9mm in diameter and/or increased ovarian volume (>10ml). A single ovary meeting these criteria is sufficient to affix as PCO morphology.[5,6]

It comprises a group of signs and symptoms like anovulation (oligomenorrhea or amenorrhea) and hyperandrogenism (usually hirsutism, acne, and sometimes alopecia.[6]

METHODS

This was cross sectional study conducted at Navodaya Medical College, Hospital and Research Centre, Raichur from July 2021 to August 2022. There were 100 patients included in this study.

Inclusion criteria

Inclusion criteria were the all adolescent and reproductive age group women attending gynecology out-patient department with age group 15-45yrs, patients with central obesity, and patient diagnosed clinically, biochemically and sonographically as PCOS.

Exclusion criteria

Exclusion criteria were women with clinical evidence of thyroid disorder, those clinically suspected to have cushing's syndrome, androgen secreting neoplasms, congenital adrenal hyperplasia, and women with hyperprolactinemia.

Methodology

After obtaining written and informed consent from the patient. Study was conducted in Department of Obstetrics and Gynaecology in Navodaya medical college. Detailed menstrual history and obstetric history including history of married life, parity, and number of abortions was asked. Clinical and general examination was done which include measurement of pulse, blood pressure, respiratory rate and temperature. This will help to know the general health condition of the patient. Details of any dermatological complications such as hirsuitism, acne, acanthosis nigricans and patters of alopecia will be asked from the patient.

Anthropometric examination including measurement of weight (in kg) and height (in m) was done to calculate the BMI of the patient, and other anthropometric indices like waist circumference, hip circumference, waist/hip ratio to be calculated. These helped to measure the level of overweight and obesity in the subjects. Gynecological examination including per abdominal examination, per speculum examination and per vaginal examination was done to rule out any other gynecological complication which may affect the study.

Data collection

All data of patients were collected in approved proformas. Later relevant data for analysis and comparison were recognized into Microsoft excel data sheet format.

Statistical analysis

Data was analysed using IBM SPSS Version 21 software chi squared test used.

RESULTS

Table 1 shows among the study participants 49% of the cases were in the age group of 15-24 years, 48% in the age group of 25-34 years, and 3% in the age group of >35 years which was not statistically significant.

Table 1: Distribution of age category among the study participants (n=100).

Age category	PCOS on USG		Total	P value
	Positive	Negative		
15 to 24	42 (51.22)	7 (38.89)	49 (49)	
25 to 34	37 (45.12)	11 (51.11)	48 (48)	0.178 Person Chi-square
35 and above	3 (3.66)	0	3 (3)	
Total	82 (100)	18 (100)	100 (100)	

Table 2 shows among the study participants 82 cases had oligomenorrhoea cycles and 18 had regular cycles of which 74 (90.24%) who had oligomenorrhoea had PCO morphology on USG and 8 (9.75%) who had regular cycles had PCO morphology on USG and 8 (9.75%) who had regular cycles have PCO morphology on USG which was found to be statistically significant.

Table 2: Distribution of oligomenorrhea category among the study participants.

Oligomenorrhoea	PCOS on USG (%)		Total (%)	P value
	Positive	**Negative**		
Yes	74 (90.24)	8 (44.44)	82 (82)	
No	8 (9.75)	10 (55.55)	18 (18)	0.0000046 Pearson Chi-square
Total	82 (100)	18 (100)	100 (100)	

Table 3: Distribution of hirsutism among the study participants.

Hirsutism	PCOS on USG (%)		Total (%)	P value
	Positive	**Negative**		
Yes	28 (34.15)	10 (55.56)	38 (38)	
No	54 (65.85)	8 (44.44)	62 (62)	0.09 Pearson Chi-square
Total	82 (100)	18 (100)	100 (100)	

Table 3 shows among the study participants 38 cases had hirsutism, of which 28 (34.15%) who had hirsutism had PCO morphology on USG and 54 (65.85%) who had no hirsutism, had PCO morphology on USG which was not significant.

Table 4 shows among the study participants 74 women were obese and 26 women were non obese, of which 68 who were obese had PCO morphology on USG and 14 who were not obese had PCO morphology on USG and 12 obese women had no PCO morphology on scan which was statistically significant.

Table 4: Distribution of BMI among the study participants.

BMI category	PCOS on USG		Total (%)	P value
	Positive	**Negative**		
Obese	68%	6%	74	
Non obese	14%	12%	26	0.000014 Pearson Chi-square
Total	82 (100%)	18 (100%)	100 (100)	

Table 5: Distribution of LH:FSH among the study participants.

PCOS as per LH/FSH	PCOS on USG (%)		Total (%)	P value
	Positive	**Negative**		
Positive	29 (35.37)	8 (44.44)	37 (37)	
Negative	53 (64.63)	10 (55.56)	63 (63)	0.47 Pearson Chi-square
Total	82 (100)	18 (100)	100 (100)	

Table 5 shows among the study participants 37 cases had deranged LH:FSH ratio and 63 cases had normal LH:FSH ratio, of which 29 (35.37%) who had deranged LH:FSH had PCO morphology on USG and 53 (64.63%) who had normal LH:FSH ratio had PCO morphology on USG and 8 (9.75%) who had regular cycles have PCO morphology on USG which was not significant.

DISCUSSION

Polycystic ovary syndrome is one of the most common endocrine disorders in women in reproductive age. This disorder is a significant public health concern in society, which therefore indicates a need to accurately identify the proportion of women affected.

The mean age was 24.27(±5.64), mean BMI was 26(±4.8). Among the PCOS women 82% had oligomenorrhoea, 38% had hirsuitism and LH:FSH ratio deranged in 37% cases.

The association between women having oligomenorrhoea and obesity with PCO morphology on scan was statistically significant (Table 6).

Table 6: Comparison of age category.

Age category	Present study	Murlidhar et al
18-26 years	49%	44%
27-35 years	48%	53%

In present study out of 100 subjects, maximum subjects were from the age group, 49% of the cases were in the age group of 15-24 years, 48% in the age group of 25-34 years, and 3% in the age group of >35 years. In contrast Murlidhar et al in the year 2015 reported 53% among 27-35 years age group as compared to our study due to the physiological decline of follicles.[7]

Table 7: Comparison of presenting complains.

Complains	Present study (%)	Ramanand SJ et al (%)
Menstrual irregularities	82	64
Hirsutism	38	44
Weight gain	74	75

In the present study, most common complaint was menstrual irregularities 82 (82%) followed by weight gain 74 (74%), hirsutism 38 (38%). In contrast, the study which was conducted by Ramanand et al in the year 2013 revealed the most common complaint was weight gain 75 (75%) followed by menstrual irregularities 64% and hirsutism (44%) (Table 7).[8]

Comparison of BMI and WHR

In present study, among 100 cases 74 had BMI >25 and Waist hip ratio of >0.80 highlights that there is more central obesity, while in study conducted by Spandana et al in the year 2017 revealed that >50% had BMI >25 and WHR >0.80 was seen in 38% of patients and another study conducted by Thanguvelu et al in the year 2017 had similar values (Table 8).[9,10]

Table 8: Comparison of BMI and WHR.

	Present study	Spandana et al	Thangavelu M et al
BMI>25	74%	50%	62%
WHR>0.8	24%	38%	34%

In present study 37% had increased LH:FSH ratio >2, an abnormality of the hypothalamic pituitary ovarian or adrenal axis has been implicated in PCOS. Disturbance in the pulsatality of GnRH results in the relative increase in LH and FSH release.

An abnormal feedback mechanism by ovarian estrogen is blamed to play the role in increase in LH release. Many researchers revealed LH:FSH ratio >2 diagnostic for PCOS. However, Nizem et al at their study showed that 16% had elevated LH/FSH ratio (Table 9).

Table 9: Comparison of LH:FSH.

LH:FSH	Present study	Nizem et al
Ratio >2	37%	16%

CONCLUSION

PCOS is one of the most prevalent disease with endocrine and metabolic implications. It usually presents with menstrual irregularities and signs of androgen excess such as hirsutism and acne. The main endocrine abnormality associated with PCOS is insulin resistance, which in the long term may lead to diabetes and cardiovascular morbidity. Early recognition and prompt treatment in adolescents is essential for preventing long-term sequalae. Implications of PCOS are lifetime risks of endometrial cancer, ovarian cancer, type2DM. Thus, early and timely diagnosis is the key for its treatment. Awareness among young girls is required as they are the primary target. Awareness can be spread through healthcare providers by conducting presentations, workshops, seminars at various places to educate the female population about this chronic syndrome. Weight reduction and lifestyle modification is essential and should always accompany any treatment modality, especially in the crucial life period of adolescence. Metformin is the most widely used insulin resistance-reducing agent. With efficacy and few side effects reported, OCPs remain a good therapeutic option, especially in patients with clinical evidence of hyperandrogenemia, while cyclical progestins are used when cycle control is the main therapeutic target.

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