

Poly-Cystic Ovarian Syndrome: Our Experience At A Tertiary Health-Care Center, Ahmedabad, Western India

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Abstract:

Introduction:

Polycystic ovarian syndrome (PCOS), also known as Stein-Leventhal syndrome, is a frequently occurring metabolic and reproductive endocrinopathy which is rapidly gaining epidemic proportions. The aim of our study is to find out and to contribute to the small but growing literature by investigating psychosocial dimensions of women with PCOS in the developing urban as well as rural,

India.

Materials and Methods:

A retrospective hospital-based study was undertaken at our institute - Sheth V.S. General and Sheth C.M. Hospital, Smt. N.H.L. Municipal Medical College, Ahmedabad, to assess the prevalence of polycystic ovarian syndrome (PCOS), presentation and diagnostic evaluation. Among 2930 cases of PCOS over a study period of 2 years, 300 cases of reproductive age (18-44 years) were included.

Results:

The prevalence of PCOS among them was 23.3% by Rotterdam criteria. Nonobese comprised 74.7% of PCOS cases. 25.3% cases were found to be obese according to BMI ($>30 \text{ kg/m}^2$). Most common clinical manifestation was found to be menstrual irregularities (71%). Hyperprolactinemia was found in 11.3%. Overt hypothyroidism was present in 3.3% cases. Obese girls with PCOS were more hirsute, hypertensive, and had significantly higher mean insulin and 2 h post 75 g glucose levels compared with non-obese PCOS. According to Rotterdam's criteria, USG diagnosis of the PCOS was found to be 82.7%.

Conclusion:

PCOS has a wide range in age of manifestation and symptomatology. It also presents with delayed manifestations which has many potential metabolic and cardiovascular risks if not managed appropriately. This study demonstrates that PCOS is an emerging disorder during adolescence and screening could provide opportunity to target the group for promoting healthy lifestyles and early interventions to prevent future morbidities.

Keywords: PCOS, Infertility, Obesity, Insulin Resistance, Anovulation, Hirsutism

Introduction:

Polycystic ovarian syndrome (PCOS), also known as Stein-Leventhal syndrome, is a frequently occurring metabolic and reproductive endocrinopathy. Prevalence in reproductive age group is reported in various studies as 5-20%.^[1-3] PCOS women present with a constellation of symptoms which significantly impacts the quality of life. These women are at higher risk for various morbidities such as obesity, insulin resistance, type II diabetes mellitus, cardiovascular disease (CVD), infertility, malignancy, and psychological disorders.^[3] Young women with PCOS mainly present with reproductive problems such as hyperandrogenism, menstrual irregularities, infertility and chronic anovulation. Infertility increases 10 folds in women with PCOS and affects up to 40%.^[2-4] PCOS reduces fertility due to associated endocrine, metabolic and gynecological abnormalities that impact on the quality and function of the ovary. Derangements in factors involved in normal follicular development lead to arrest of follicular growth as the follicles reach a diameter of 4-8 mm, dominant follicle does not develop, and ovulation does not ensue. Increased insulin resistance which causes an

increased LH/FSH ratio and decreased SHBG leads to hyperandrogenism. Studies have also reported poor pregnancy outcomes in these women. [5,6]

There is no single definitive test to diagnose PCOS, however, three different guidelines,

- 1) National institute of health criteria (NIH),
- 2) Androgen excess- PCOS society of India criteria (AE-PCOS) or
- 3) Rotterdam criteria can be followed. [7-9]

Insulin resistance and obesity are considered intrinsic to PCOS but neither of them is included in the guidelines and should therefore be used for diagnostic purposes. [10] Despite its high prevalence and implications on reproductive health, PCOS is underdiagnosed. The objectives of the present survey were to study the prevalence of PCO in women with infertility, their symptomatology, endocrine profiles and coexisting factors of infertility in women with PCOS.

Methods:

A retrospective analysis of computerized data of randomly selected 300 cases of PCOS from January 2017 to December 2018, performed at Sheth V.S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ahmedabad, Gujarat, India.

Data regarding history such as age, active married life, infertility, menstrual history, etc, data of height, weight, BMI, thyroid enlargement, galactorrhea and hirsutism was recorded. Clinical and sonography findings, women with features of PCOS on ultrasound were identified and investigations such as serum FSH, LH (on day 2/3 of cycle), prolactin, estradiol, Progesterone, Serum AMH, DHEA-S, fasting sugar, fasting insulin, etc were recorded from the data. We have presented our study according to Rotterdam criteria as mentioned below (includes any 2),

- 1) Clinical and/or biochemical hyperandrogenism,
- 2) Oligoovulation or anovulation,
- 3) Polycystic ovaries on USG

The diagnosis of Polycystic ovaries was made on USG if there were presence of 12 or more peripheral follicles each 2-9 mm in diameter in one or both ovaries, increased ovarian volume (10 cm^3) in one or both ovaries.

Results:

Being a big tertiary health care center with teaching facilities and all super specialties, we provide advanced services to about 10 million population of city areas as well as rural and the people of other states of Western India. In last 5 years (January 2014-December 2018) we had managed 33405 gynecology cases, by medical management or required surgical procedures. During the study period (January 2017-

December 2018)- we had total 12576 gynecology cases out of which we found 2930 cases with symptoms and signs of PCOS and were confirmed by required investigations, according to Rotterdam's criteria. Thus the Prevalence of PCOS in our study was found to be 23.3%.

Our study is randomly selected 300 cases of PCOS from these diagnosed cases.

Table 1: Demographic Distribution

Age (Year)	<20	10 (3.3%)
	21-30	248 (82.7%)
	>30	42 (14%)
Locality	Urban	195 (65%)
	Rural	105 (35%)
Education	Illiterate	18 (6%)
	Primary Education	81 (27%)
	Secondary Education	104 (34.7%)
	Higher Education	97 (32.3%)
Socio-Economic Class (Modified Kuppuswamy Scale)	Upper	15 (5%)
	Upper Middle	85 (28.3%)
	Lower Middle	94 (31.3%)
	Upper Lower	69 (23%)
	Lower	37 (12.3%)
BMI	<18	7 (2.3%)
	18-25	126 (42%)
	26-30	94 (31.3%)
	31-35	66 (22%)
	>35	7 (2.3%)
Waist-Hip Ratio	<0.85	212 (70.7%)
	>0.85	88 (29.3%)

Among the 300 patients, 248 (82.7%) of them were in the 21-30 years of age group, 42 (14%) of them were >30 years and 10 (3.3%) below 20 years of age. (Table 1)

Majority of the patients were in a BMI range of 18-25 (42%). 88 (29.3%) patients had waist to hip ratio >0.85. 65% cases were residing in urban areas. Majority of the cases (31.3%) were from lower middle socio-economic class according to modified Kuppuswamy classification. **(Table 1)**

Table 2: Clinical Features

Clinical Features	Menses	
	Irregular	213 (71%)
	Regular	87 (29%)
	Infertility	
	Yes	128 (42.6%)
	No	172 (57.4%)
	Acne	
		123 (41%)
	Hirsutism	
		178 (59.3%)
	Loss of hair	
		65 (21.7%)
	Pigmentation	
		203 (67.7%)
Depression		
	25 (8.3%)	

Menstrual irregularity was found in 213 (71%) women, however, 87 (29%) had regular menstrual cycles. 22 complained of dysmenorrhoea, 17 had heavy menstrual bleeding and 6 patient reported having bleeding only after withdrawal was given. 128 (42.6%) presented with infertility. Followed in a decreasing order of clinical features, skin pigmentation (67.7%), hirsutism (59.3%), acne (41%), loss of hair (21.7%). Depression was noted in 25 (8.3%) patients. **(Table 2)**

Table 3: Laboratory Investigations

Laboratory Investigations	LH/FSH	
	<1	139 (46.3%)
	1-2	101 (33.7%)
	2.1-2.9	51 (17.0%)
	>3	9 (3.0%)
	TSH	
	Euthyroid (0.39-4.6 mIU/L)	235 (78.3%)
	Subclinical (4.6-20 mIU/L)	55 (18.4%)
	Overt (>20 mIU/L)	30 (3.3%)
	Prolactin	
	<25 ng/ml	266 (88.7%)
	>25 ng/ml	34 (11.3%)
	USG findings	
	Normal	31 (10.3%)
	PCO	248 (82.7%)
	Others	21 (7.0%)

3% cases had FHS/LH Ratio more than 3. 235 (78.3%) cases were found to be euthyroid. 30 cases had overt hypothyroidism. 88.7% cases had prolactin level below 25 ng/ml. **(Table 3)**

On ultrasound examination, 248 (82.7%) women had features of PCOS. Diagnostic laparoscopy as well as operative laparoscopy in the form of adhesiolysis, ovarian drilling, and constructive surgery for endometriosis was carried in these women when indicated.

Discussion:

PCOS is a set of symptoms owing to underlying endocrinopathy. Infertility due to PCOS is one of the concerning consequences which is subjected to continuous studies. Not all women with PCOS are infertile. For those that do, anovulation, infrequent ovulation, altered levels of gonadotrophins, hyperandrogenemia and hyperinsulinemia are the causes cited. In India, experts claim rising trend of the women to be affected by PCOS and yet no proper published statistical data on the prevalence of PCOS in infertile women India is available. The prevalence depends on the diagnostic criteria used. In the present

study, prevalence of PCOS in infertile women was up to 23.3%. Worldwide, studies reported prevalence of PCOS in infertility as 53.4%, 40% and 56%.^[11-13]

PCOS is closely associated with obesity, overweight and elevated BMI. Obesity is known to increase insulin resistance, hyperandrogenism and menstrual irregularities leading to further exacerbations of metabolic, reproductive and physiological features of PCOS. Mean BMI among the study patients was $27.54 \pm 2SD$ which indicates that majority of women were overweight ($25-29 \text{ kg/m}^2$) and obese ($>30 \text{ kg/m}^2$). Similar findings were noted in various other studies.^[11,14,15] It has been suggested that even a modest loss of up to 5% of the initial body weight can result in spontaneous ovulation, restoration of menstrual cycle regularity, and pregnancy in obese women with PCOS.^[16] Menstrual irregularity is one of the key symptom of PCOS women and in present study, it was found in 71% women which correlates with other studies.^[17,18]

Hirsutism was noted in 59.3% of women on contrast to compared with the findings published in literature of a few studies as 28% and 30%.^[18,19] However, few studies have reported a higher incidence (64%) of hirsutism in women with PCOS.^[17] Derangement in the gonadotrophin ratio (FSH/LH) occurs in PCOS due to discriminate increase in LH levels. In the present study, deranged gonadotrophin ratio was noted in 54% of obese and overweight group. On ultrasound examination, 82.7% women were confirmed to have features of PCOS.

PCOS not only causes infertility but, if conceived also makes the women unable to maintain pregnancy. 27% of women in this study had history of at least single miscarriage. Hence, there is a need for intensified efforts in early detection, periodic monitoring and effective treatment in these high-risk women.

Conclusion:

PCOS is a heterogenous disorder. There is a wide range in age of manifestation and symptomatology. Recent trends of sedentary lifestyle, carbohydrate and fat rich foods predispose adolescent girls to weight gain and high BMI. As a consequence, to these lifestyle changes there is an increased risk of PCOS, including hormonal imbalance, menstrual problems, infertility and altered pregnancy outcome in these women. PCOS has high prevalence in infertile women. In pregnant women it seems that the syndrome by itself has its own molecular signatures that probably take the women with PCOS to a more sensitive and vulnerable state which might cause long-term health consequences to their offspring. Moreover, it seems that the sympathetic nervous system is involved in the development of observed alterations and may play an important role in the pathophysiology of the syndrome during pregnancy. Apart from its impact on reproductive outcome, PCOS also presents with delayed manifestations which has many potential metabolic and cardiovascular risks if

not managed appropriately. Obese girls with PCOS were more hirsute, hypertensive, and had significantly higher mean insulin and 2 h post 75 g glucose levels compared with non-obese PCOS. Lifestyle modification at early age, counselling of the parents, better knowledge and attitude of women towards PCOS is crucial in improving the quality of life in women with PCOS.

Despite intriguing qualitative results, more nuanced and in-depth quantitative and qualitative work is needed to verify whether urban Indian women with PCOS contend with discrete biopsychosocial trajectories of health and well-being. Future research is warranted on cross-cultural conceptualization of PCOS as well as the relevance of marital status, geographic location, socioeconomic status, diet, lifestyle and attitudes about health to the psychosocial experience of PCOS.

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