

Clinical presentations of polycystic ovary syndrome in a tertiary care centre of southern Rajasthan, India

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Abstract

Background: Polycystic ovarian syndrome (PCOS) is a reproductive-endocrine-metabolic disorder that involves multiple medical specialities. It can affect the entire lifespan of a woman. This disorder often strikes young girls at the time when they are stepping into the newer horizon of youth. Considering the symptoms of PCOS such as obesity, infertility, hirsutism, baldness etc., PCOS can be termed as “Silent Killer” of a woman’s womanhood. **Material and Methods:** This observational study was carried out from Jan. 2016 to Sept. 2019 in Ananta Institute of Medical Sciences and Research Centre. A total of 100 newly diagnosed post-pubertal PCOS patients consulting gynaecology and dermatology department were studied. Statistical analysis was carried out by the Chi-square test and independent samples *t*-test. Statistical significance was determined at a level of $P < 0.05$. **Results:** Authors concluded that PCOS can occur in both obese and non-obese women with high prevalence of cutaneous manifestations. **Conclusion:** PCOS is a public health issue of great concern and is well said to be a hidden epidemic. It represents an Iceberg with multiple tips and widening base. The dermatologic manifestations of PCOS play a significant role in diagnosis. Success in the effective management of women with PCOS is through a trans-disciplinary integrative and synchronized clinical care by the gynecologist, endocrinologist, dermatologist, nutritionist, and physical trainer.

Keywords: Acanthosis nigricans, Hirsutism, Hyperandrogenism, Polycystic ovary syndrome

Introduction

Polycystic ovary syndrome (PCOS) is a hyperandrogenic disorder in women of reproductive age group. It is a multisystem metabolic disorder, which has a major impact on the quality of life as well as fertility [1,2]. In 1935, American gynaecologists Irving F. Stein and Michael L. Leventhal reported a series of 7 women who presented with oligo/amenorrhoea, hirsutism, obesity, infertility, and bilateral polycystic ovaries (Stein–Leventhal syndrome) [3].

Previously, triad of oligomenorrhoea, hirsutism and obesity along with enlarged polycystic ovary (PCO) were the diagnostic criteria of PCOS but now it is accepted that this problem arises from persistent anovulation with a spectrum of etiologies that results in overproduction of androgens, primarily from the ovary, and is associated with metabolic disturbances like

insulin resistance, and dyslipidemia. The first recognition of an association between glucose intolerance and hyperandrogenism (HA) was the famous report of the bearded diabetic woman by Archard and Thiers in 1921 [4]. The apparent underlying reason is persistent anovulation over a prolonged period. PCOS can be considered as a functional derangement resulting from different endocrinopathies that lead to anovulation and the subsequent development of polycystic ovaries.

The metabolic and reproductive abnormalities predispose women to develop infertility, type II diabetes, dyslipidemia, premature arteriosclerosis and endometrial cancer, necessitating early diagnosis and appropriate treatment [5]. Treatment of these concurrent abnormalities in PCOS woman will result in a better outcome. PCOS women may present with a complaint of failure to conceive. PCOS can result in primary or secondary infertility.

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The estimated prevalence in women of reproductive age is 5-10%. According to the Rotterdam criteria (2003), the prevalence among the general female population will raise up to 10% [6].

The present study was aimed to report clinical characteristics of polycystic ovarian syndrome in a tertiary care centre of southern Rajasthan.

Material and Methods

Type of study: This observational study was carried out from Jan. 2016 to Sept. 2019 in Ananta Institute of Medical Sciences and Research Centre. A total of 100 newly diagnosed post-pubertal PCOS patients consulting gynaecology and dermatology department were studied.

Ethical Approval: Institutional ethical committee approval was taken prior to commencement of this observational study.

Inclusion criteria: Patients complaining of irregular menses and /or infertility were enrolled as per NIH, Rotterdam and AES (Table 1) criteria for PCOS after taking written informed consent.

Table-1: Diagnostic criteria for polycystic ovary syndrome.

NIH Consensus Criteria (all required)	Rotterdam criteria (two out of three required)	AES criteria (all required)
1. Menstrual irregularity due to oligo- or anovulation. 2. Clinical and/or biochemical signs of hyperandrogenism. 3. Exclusions of other disorders: NCCAH, androgen-secreting tumours.	1. Oligo- or anovulation. 2. Clinical and/or biochemical signs of hyperandrogenism. 3. Polycystic ovaries (by ultrasound).	1. Clinical and/or biochemical signs of hyperandrogenism. 2. Ovarian dysfunction - oligo-anovulation and/or polycystic ovaries on ultrasound. 3. Exclusion of other androgen excess or ovulatory disorders.

NIH: National Institutes of Health; AES: Androgen Excess Society; NCCAH: nonclassic congenital adrenal hyperplasia

Exclusion criteria: Patients having any major systemic illness, congenital adrenal hyperplasia, acromegaly, functional hypothalamic amenorrhea, and patients receiving drugs for any other systemic illness (except hypothyroidism) were excluded.

Study design: The following clinical data were collected: age of menarchae, irregular menses or oligomenorrhoea (a cycle interval >35 days but <6 months), amenorrhoea (absence of menses for >182 days), marital status, type 1 or 2 diabetes mellitus, thyroid dysfunction, hyperprolactinemia, as well as family history of PCOS and being overweight. Pregnancy was ruled out in sexually active women, complaining of amenorrhea. Body mass index (BMI), hirsutism, acne, acanthosis nigricans seborrhic dermatitis and female pattern hair loss were also recorded.

The following laboratory data were collected: levels of luteinizing hormone (LH; normal range: 1.9–12.5 IU/L), follicle-stimulating hormone (FSH; normal range: 2.5–10.2 IU/L), Serum dehydroepiandrosterone (DHEAS; normal range: 61.2–493.6 µg/dl) and testosterone (normal range: 14–76 ng/dl), prolactin (PRL; normal range: 2.8–29.2 IU/L), thyroid-stimulating hormone (TSH), and free thyroxine (T4) and results from ovarian ultrasound completed transabdominally or transvaginally. Ultrasounds were described as polycystic if there were 12 or more follicles in 2 to 9 mm range per ovary.

Body mass index (BMI) as Standard Consensus Statement for Indian population was considered, i.e., Normal BMI: 18.0–22.9 kg/m², Overweight: 23.0–24.9 kg/m² and BMI ≥ 25 was considered as obese [7].

Statistical analysis- Statistical analysis of the data was performed by appropriate statistical methods using the Statistical Package for Social Sciences (SPSS Version 17). Statistical significance of the results was determined by the Chi-square test and independent samples *t*-test. Statistical significance was determined at a level of *P* < 0.05.

Results

The present study comprised of 100 female patients. The anthropometric characteristics of the study population including mean age, mean age at menarche and BMI are given in Table 2.

Table-2: Anthropometric and hormonal data of study population

Characteristics	Value (mean \pm SD), n=100
Mean age (in years)	24.37 \pm 3.33
Mean age at menarche (in years)	13.68 \pm 0.71
BMI (kg/m ²)	26.67 \pm 3.97
Testosterone (ng/dl)	58.47 \pm 26.11
FSH (IU/L)	5.41 \pm 1.23
LH (IU/L)	8.97 \pm 5.66
Prolactin (IU/L)	16.23 \pm 6.46
DHEA (μ g/dl)	129.36 \pm 37.89

Mean age of menarche in our patients was 13.6 \pm 0.7 years. Menstrual disturbances were seen in 85 females, whereas 15 females had a normal menstrual pattern. The most common menstrual disturbance noticed was oligomenorrhea (72 females, 84.7%), oligomenorrhea followed by heavy menstrual flow and menorrhagia (5 females each, 5.88%) and irregularly irregular menses (3 females, 3.5%), shown in Figure 1.

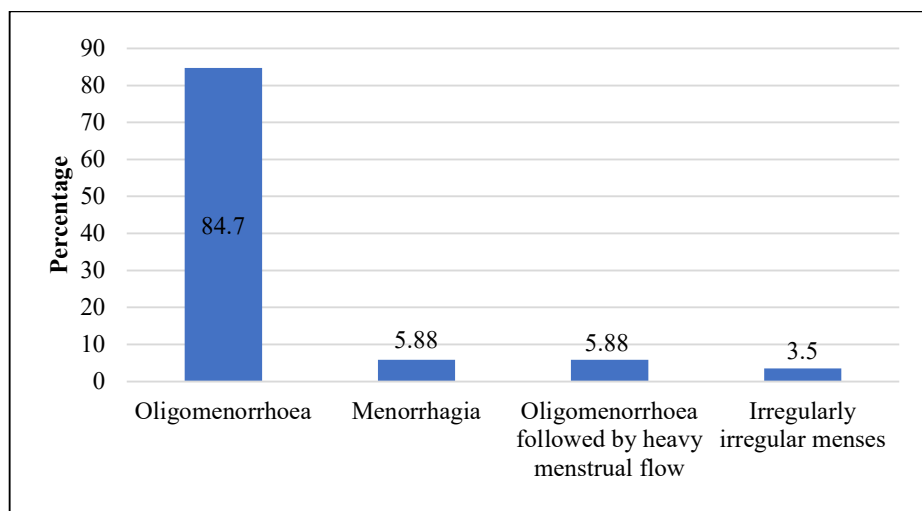


Fig-1 Prevalance of menstrual distubances.

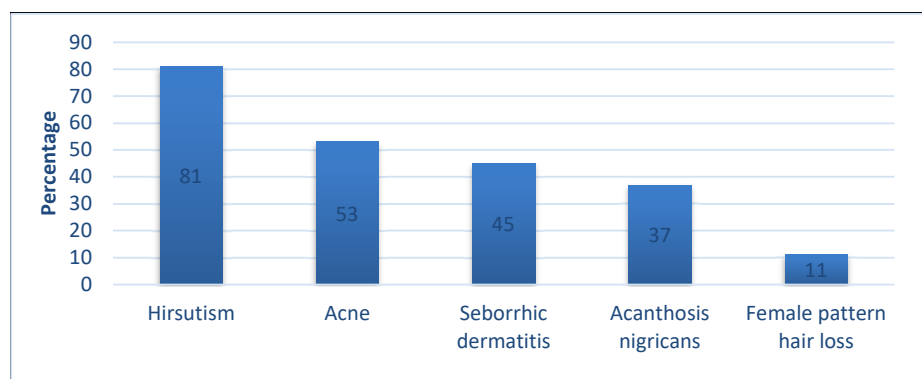


Fig-2 Prevalence of cutaneous manifestations

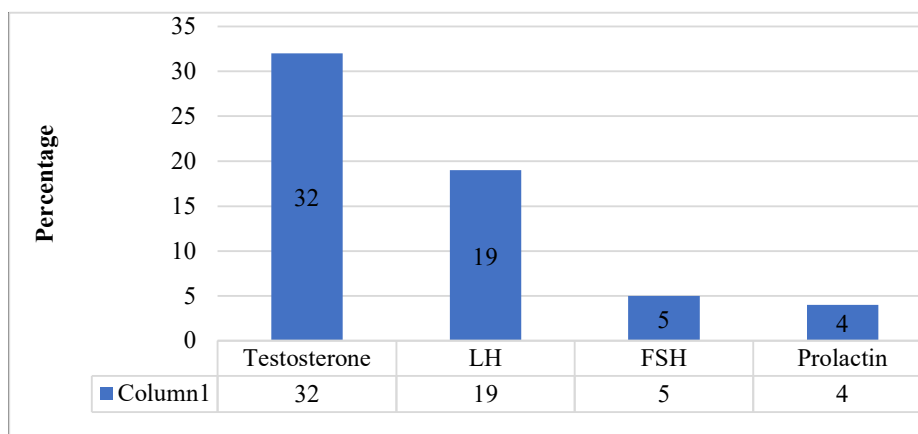


Fig-3 Increased hormonal levels

30 women were normal weight, 40 were overweight and remaining 30 were obese.

Out of 100 patients studied, 32 were married and 68 were unmarried. Among the married group of 32 patients, 6 (18.75%) had normal obstetric history and remaining 26 (81.25%) patients had primary or secondary infertility. Mean \pm SD values of LH, FSH, prolactin, testosterone, DHEAS in the present study patients are shown in Table 2. Cutaneous manifestations secondary to a hyperandrogenic state in these patients are depicted in Figure 2. The prevalence of hirsutism, acne, seborrheic dermatitis, acanthosis nigricans (AN) and female pattern hair loss was found to be 81%, 53%, 45, 37%, 11% respectively.

Increased levels of hormones in the patients of PCOS are shown in Figure 3. The most common hormonal abnormality encountered in our patients was raised testosterone levels (32%).

Discussion

Stein and Leventhal, in 1935, described a series of 7 women who presented with oligo/amenorrhoea along with hirsutism, obesity, infertility, and bilateral polycystic ovaries (Stein–Leventhal syndrome) [3]. They termed this ovarian defect as polycystic ovarian disease (PCOD). As PCOD is associated with multiple metabolic disorders and is now known as polycystic ovarian syndrome (PCOS).

PCOS is a complex heterogeneous disorder with key pathophysiologic factors appear to include androgen excess, abnormal gonadotropin dynamics etc. Excess androgen production in the ovary impairs maturation of follicles, leading to follicular atresia and reduced reproductive function. The resultant hyperandrogenemia may produce clinical hyperandrogenism. In PCOS, due to low levels of progesterone resulting from oligo- or anovulation, reflex increased production of hypothalamic GnRH is thought to produce increased levels of luteinizing hormone (LH) [8]. Increase LH secretion relative to FSH stimulates production of androstenedione by ovarian theca cells. Insulin also plays a central role in PCOS pathophysiology as insulin resistance and hyperinsulinemia may increase androgen levels by decreasing sex hormone binding globulin

(SHGB) [9]. Based on this, AN and hirsutism can be expected to be present together in majority of the PCOS women. Similar to Bekx et al [10], who reported elevated total testosterone in 21% of adolescents with PCOS, it was observed that 32% of girls with PCOS had high total testosterone.

Patient usually comes to gynaecologist for one or more complaints of hyperandrogenism. PCOS is a multisystem disorder having relation with obesity. The prevalence of obesity and overweight women in the present study was 30% and 40%, respectively. A study conducted by Majumdar et al. revealed the prevalence rate of obesity to be 37.5% [11]. Ramanand et al. reported irregular cycles in 100% of their study participants, whereas infertility was present in 21% [12]. In the present study population, Menstrual disturbances were seen in 85 females, whereas 15 females had a normal menstrual pattern. The most common menstrual disturbance noticed was oligomenorrhea (72 females) then oligomenorrhea followed by heavy menstrual flow and menorrhagia (5 females each) and irregularly irregular menses (3 females). In the present study, out of 32 married women 26 patients (81.25) had complaints of primary or secondary

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infertility. In the present study, maximum PCOS patients have one or the other cutaneous manifestations with hirsutism having the highest prevalence of 81%. Saxena et al. in their study, reported that the prevalence of hirsutism was 89% and 80% in obese and lean PCOS, respectively [13]. Acne was the next common clinical manifestation of hyperandrogenism noted in the present study, which was seen in 53% of the women. Many studies have recorded the prevalence of acne in PCOS patients as 9.8–34% [14,15]. Seborrhic dermatitis is another cutaneous feature present in PCOS. However, its prevalence in PCOS is not exactly known [16]. The prevalence of seborrhea was found to be 45% in the present study. In addition to androgen hormones, the patient's genetic predisposition, and climate and emotional factors are other important factors affecting seborrhea.

Acanthosis Nigricans is a velvety, mossy, hyperpigmented skin disorder. Presence of AN appears to be more a sign of insulin resistance or medication reaction [17] than distinct disease itself. Although it is commonly observed in settings such as obesity, PCOS, and diabetes; it can also be associated with multiple genetic variants, and malignancy [18]. Usually dorsal surface of the neck and intertriginous areas, such as the upper thigh and axilla are involved. In the present study, the prevalence of acanthosis nigricans was 37%. In 1976, Kahn and colleagues found out association of HA, insulin resistance and AN - a distinct disorder in adolescent girls called as TYPE A syndrome-(mutation of insulin receptor) with the features of virilization, increased muscle bulk, clitomegaly, temporal balding, deepening of voice and insulin resistance with striking AN [19].

Only a few studies have specifically examined pattern of hair loss in women with PCOS. In a study involving a cohort of 950 women referred for clinical hyperandrogenism, of whom 72% were diagnosed with PCOS, alopecia ranging from Ludwig pattern type I (mild) to type III (severe) was found in 3.2% [20]. The prevalence of female pattern hair loss in PCOS women was found to be 11%, in the present study.

Conclusion

PCOS is a public health issue of great concern and is well said to be a hidden epidemic from various studies. It represents an Iceberg with multiple tips and widening base. PCOS is not only a reproductive endocrine disorder but is also associated with insulin resistance and metabolic disorder with a future risk for type 2 diabetes, cardiovascular risk and malignancy.

What this study adds to the existing knowledge?

The dermatologic manifestations of PCOS play a significant role in diagnosis and constitute a substantial portion of the symptoms experienced by women presented in gynaecological outdoor with irregular menses. Patients must be counseled regarding the long duration of treatment that includes lifestyle modifications along with systemic treatment. Success in the effective management of women with PCOS is through a trans-disciplinary integrative and synchronized clinical care by the gynecologist, endocrinologist, dermatologist, nutritionist, and physical trainer.

Author's contribution

Dr. Smita Barya: Formulated the aims and objectives with study design and collected patient data.

Dr. Meetu Babel: Contributed in preparation of manuscript and data analysis.

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Conflict of interest: None declared

Ethical Approval: This study was approved by the Institutional Ethics Committee

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