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Original Research Article

A study on the clinical and social aspects of polycystic ovarian syndrome in women of reproductive age group conducted at a specialized medical facility

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ABSTRACT

Background: Polycystic ovarian syndrome (PCOS) is seen as a complex illness that can present in women of various ages, including teenagers and post-menopausal women, not just those of childbearing age. The prevalence of PCOS in India ranges from 3.8% to 22.4% in most studies. The updated diagnostic criteria in Rotterdam consensus conferences now require the presence of two of the following: irregular periods, signs of excess male hormones, polycystic ovaries on ultrasound, and ruling out other possible causes like congenital adrenal hyperplasia, androgen-secreting tumors, and Cushing syndrome.
Methods: The research was carried out on women in the reproductive age category who have PCOS and were visiting the gynecology department at Pacific medical college and hospital in Udaipur. This is prospective comparative study/descriptive cross-sectional study. A total of 150 women were part of the sample. Research was conducted to investigate the correlation between PCOS and the socio-demographic characteristics of the patient.
Results: The mean age of participants in the research was 21.68 years, with a deviation of 4.2 years. Approximately 72% are burdened by excess weight, 22% suffer from acne, 21% encounter fertility issues, 6% have amenorrhea, 80% struggle with oligomenorrhea, and 26% are classified as obese. Acne is present in 23% of the participants in the research. Around 38% of people showed signs of hirsutism.
Conclusions: Research revealed a notably high occurrence of PCOS among females aged 21 to 30, with an average age of 23. These females were from a moderate socio-economic background and resided in urban areas, with most of them being students and homemakers leading sedentary lives. The most common clinical symptoms of PCOS in women were noted to be oligomenorrhea, weight gain, infertility, hirsutism, and acne.

Keywords: Acne, Excessive hair growth, Trouble, Irregular periods, PCOS, Infertility

INTRODUCTION

Polycystic ovary syndrome (PCOS) is viewed as the most widespread endocrine disorder found in women. Several genetic and environmental factors contribute to its complex etiology. Patients may display a range of symptoms, but common clinical features include irregular menstrual cycles and/or lack of ovulation, excessive androgens, and the presence of polycystic ovaries. The occurrence of PCOS varies among different populations with diverse geography and ethnicity. Furthermore, the variation in diagnostic criteria influences the disparity in disease prevalence among observed population groups. The Rotterdam criteria, commonly utilized, detect the disease in approximately 8-13% of women.[1] In Western nations, the prevalence of PCOS ranges from 4-12%, making it the most common endocrine disorder in women of reproductive age.[2] European nations have reported a

prevalence rate of 6.5-8% for this condition. In India, studies have found a prevalence rate of 3.7%-22.5% for PCOS. The disease is characterized by symptoms such as irregular periods, excessive hair growth, and often difficulty in conceiving. Frequently observed menstrual disturbances in individuals with PCOS consist of extended unpredictable menstrual bleeding, absence of menstruation, and infrequent menstruation.[3,4] However, some women with PCOS may experience regular menstrual cycles with or without ovulation.[5] Upon examination, most women with irregular periods and approximately half of women without periods will be diagnosed with PCOS.[6] Most women showing signs of excessive androgens will likely be found to have PCOS following diagnosis.[7] Excessive levels of androgens can manifest as hirsutism, acne, and male-pattern hair loss. Hirsutism, defined as an overabundance of thick, terminal hair, is a common symptom of hyperandrogenism found in most women with PCOS.[8] Hirsutism can be evaluated using a revised Ferriman-Gallwey scoring system. More than 90% of women with regular menstrual cycles and excess hair growth are diagnosed with polycystic ovaries through ultrasound. Additionally, half of women with PCOS do not show significant hirsutism. Androgen excess can manifest as hirsutism, acne, and male-pattern hair loss. Excessive terminal hair growth, known as hirsutism, is a common sign of hyperandrogenism present in most females with PCOS. A modified Ferriman-Gallwey scoring system can be used to objectively evaluate hirsutism.[9] Most women with regular periods and excessive hair growth are found to have polycystic ovaries on ultrasound. Additionally, 50% of women without notable hirsutism can be diagnosed with PCOS.[10] Acne is a clinical sign of hyperandrogenism, but is rarely observed in PCOS. Around 33% of women diagnosed with PCOS will also have acne. Around forty percent of women with severe acne will be diagnosed with PCOS when they seek medical attention.[11,12] Approximately half of women with PCOS experience infertility.[13] Even though individuals with PCOS have a typical quantity of primordial follicles, they possess a much higher number of primary and secondary follicles. The halting of follicular growth may be explained by changes in factors important for follicular development like early luteinization of granulosa cells and insufficient secretion of follicular stimulating hormone (FSH) in PCOS.[14] This will result in the development of a higher number of follicles measuring 5-8 mm in diameter. When a mature follicle fails to develop, ovulation cannot happen successfully, leading to impaired fertility. Moreover, PCOS is associated with a higher occurrence of spontaneous abortion.[15,16]

The diagnostic criteria for PCOS have changed over the last few decades. As of now, there are three different sets of diagnostic criteria that can be used for the diagnosis. The initial criteria mentioned are the NIH/NICHD criteria, then the ESHRE/ASRM criteria, followed by the Rotterdam criteria, and finally the newest criteria from the androgen excess and PCOS society.[17] Each of the three diagnostic categories view PCOS as a diagnosis that is only made after ruling out other possible conditions. Before diagnosing PCOS, it is important to rule out other possible conditions such as Cushing syndrome, hyperprolactinemia, thyroid disorders congenital, adrenal hyperplasia, non-classic adrenal hyperplasia, androgen-secreting tumour, idiopathic hirsutism and idiopathic hyperandrogenism.[18,19]

The development of PCOS involves multiple factors in its pathogenesis. According to research, a family's history of PCOS may increase the risk of developing the condition due to multiple cases within the same family.[20] A rise in the identification of PCOS or its symptoms in first-degree relatives suggests a genetic tendency.[21] Moreover, monozygotic twins have shown higher concordance compared to dizygotic twins.[22]

PCOS is associated with various other medical conditions. Weight gain and obesity frequently occur before the clinical signs of PCOS appear.[23,24] Observing a healthy lifestyle by making dietary changes and participating in exercise therapy has been proven to reduce weight, enhance insulin resistance, lower abdominal fat, decrease testosterone levels, and improve hyperandrogenism symptoms in women with PCOS.[25] The presence of diabetes, such as type 1, type 2, and gestational diabetes, is associated with a higher prevalence of PCOS.[26]

PCOS patients who have insulin resistance are more likely to develop metabolic syndrome, reproductive dysfunction, and epilepsy.[27] Numerous prenatal and postnatal factors have been linked to an increased risk of developing PCOS in children. Prenatal factors include higher birth weight, signs of congenital virilization, and lower birth weight. Possible factors during adolescence could include premature pubarche, atypical central precocious puberty, obesity syndromes, acanthosis nigricans, and metabolic syndrome.[27]

PCOS has been shown to increase the likelihood of developing dyslipidemia. Lipid abnormalities identified include high triglycerides (TG), low high-density lipoprotein-cholesterol (HDL-C), and high low density lipoprotein-cholesterol (LDL-C).[28] Moreover, multiple studies have indicated that women with PCOS are more likely to develop hypertension. The incidence of illness and death caused by coronary heart disease in women with PCOS is not as high as previously anticipated. This discovery questions our knowledge of the cause of the coronary heart disease in the women who have the condition.[29]

Numerous international and Indian studies have been conducted to investigate the prevalence, clinical characteristics, and association of PCOS.

The purpose of this research is to assess the socio-demographic and clinical features of PCOS patients at a tertiary care facility in Rajasthan, India.

METHODS

Study setting

A descriptive cross-sectional study included adult females over 18 years old, who are pre-menopausal and have been diagnosed with PCOS, attending the gynaecology OPD at Pacific medical college and hospital in Udaipur, Rajasthan. Trained doctors conducted the clinical evaluations and tests.

Size of the sample

The gynaecology department at Pacific medical college and hospital, Udaipur, serves as both a tertiary care and referral center. We observe an average of 15-20 patients with either known or newly diagnosed PCOS visiting the clinic every month. Data collection is done from November 2023 to August 2024, a total of 150 participants were recruited for the research over a period of 10 months.

Inclusion criteria

Women over the age of 15 who have not reached menopause, and who had been diagnosed with PCOS based on the Rotterdam criteria and had not received any treatment before, were included in the study. As per the ESHRE/ASRM/Rotterdam criteria from 2003, two out of three criteria must be met to diagnose PCOS, after ruling out other diseases that present similar symptoms such as Cushing syndrome, hyperprolactinemia, and thyroid disorders, among others: Absence of ovulation or irregular ovulation, symptoms of hyperandrogenism in clinical and/or biochemical form and ovaries with multiple cysts (detected by ultrasound) were included.

Exclusion criteria

Age less than 15 years and more than 45 years, disease presenting with PCOS like feature-hypothyroidism, hyper prolactinoma, ovarian tumor, adrenal tumor and cushing syndrome were excluded from study. Pregnant women and patients who have not provided informed written consent were not included in the study.

All individuals who met the specified inclusion and exclusion criteria were enrolled in the study for a duration of ten months.

Methodology

Women of reproductive age with symptoms of PCOS attending gynaecology OPD underwent additional evaluations to confirm PCOS. Following confirmation, baseline data was obtained through the use of a questionnaire.

Analysis of data using statistical methods

Data is shown as mean, with standard deviation, and descriptive statistics were utilized for data examination.

RESULTS

Around 42 females (28%) are in the age group of 16-20 years followed by 102 (68.0%) in 21-30 years and 5(3.33%) in 31-40 years and 1 female (0.66%) Mean age of the study participants was 21.68±4.2 years (Figure 1). Patient having PCOS, lowest age was 16 years and highest age 41 years.

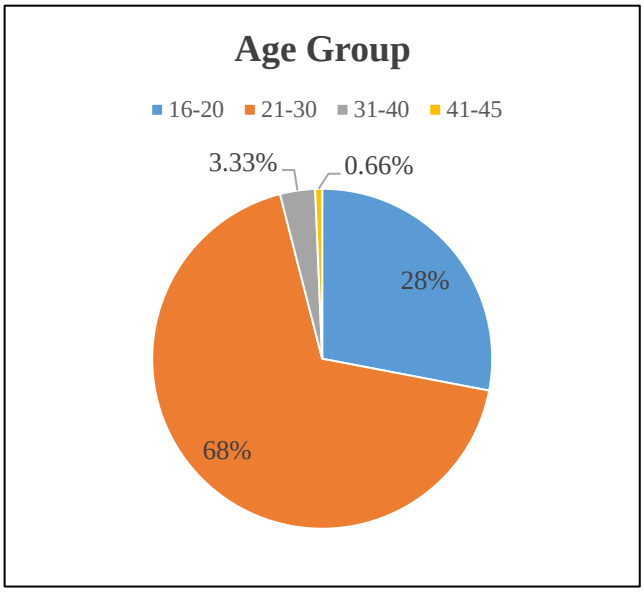

Figure 1: Distribution of the study participants according to their age, (n=150).

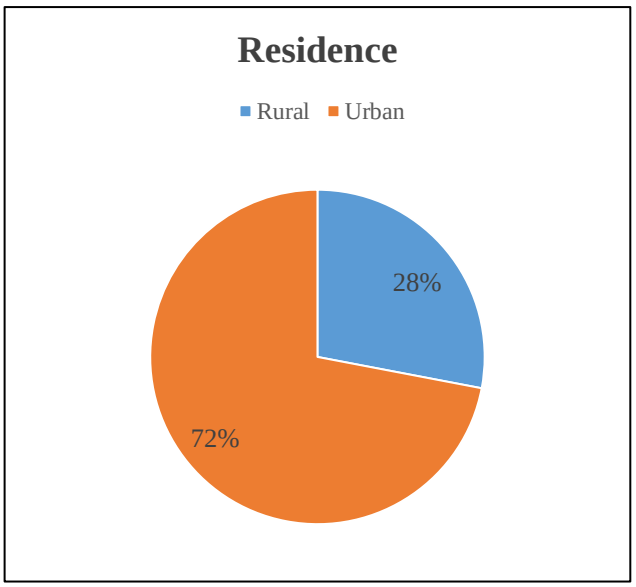

Figure 2: Distribution of study participants according to their residence, (n=150).

As shown in Figure 2 majority 108 (72%) of population belong to urban residence and 42 (28%) rural population, which indicates role of life style, food pattern and some how environmental factors also.

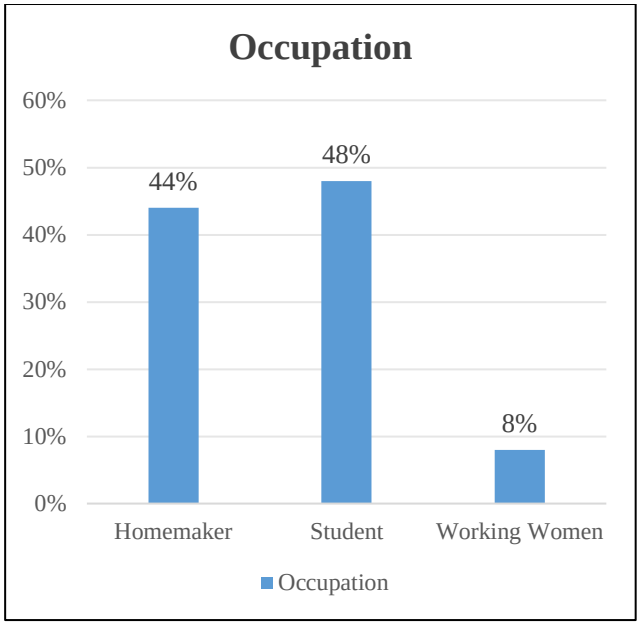

Figure 3: Distribution of study participants according to their occupation, (n=150).

According to Figure 3 major population 48% belongs to student group f/b 44% homemaker and 8% of them are working women.

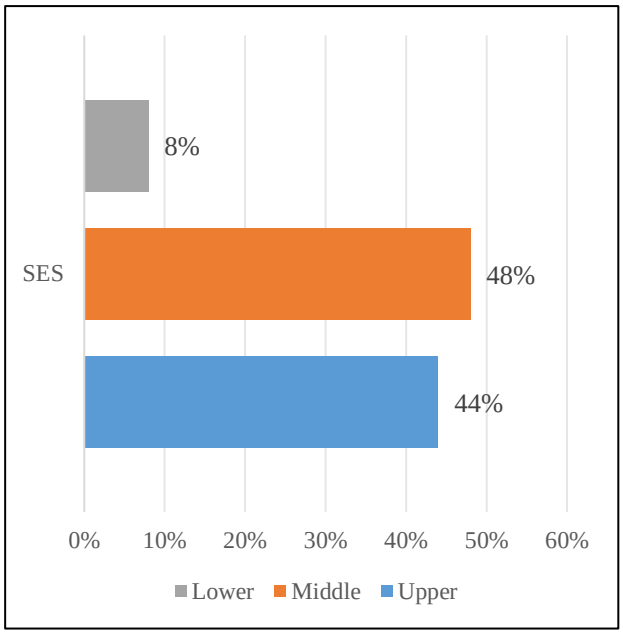

Figure 4: Distribution of participants according to socio-economic status, (n=150).

As shown in Figure 4 major populations (48%) belongs from middle socio-economic status class of Kuppuswami scale, 44% from upper and only 8% from lower SES.

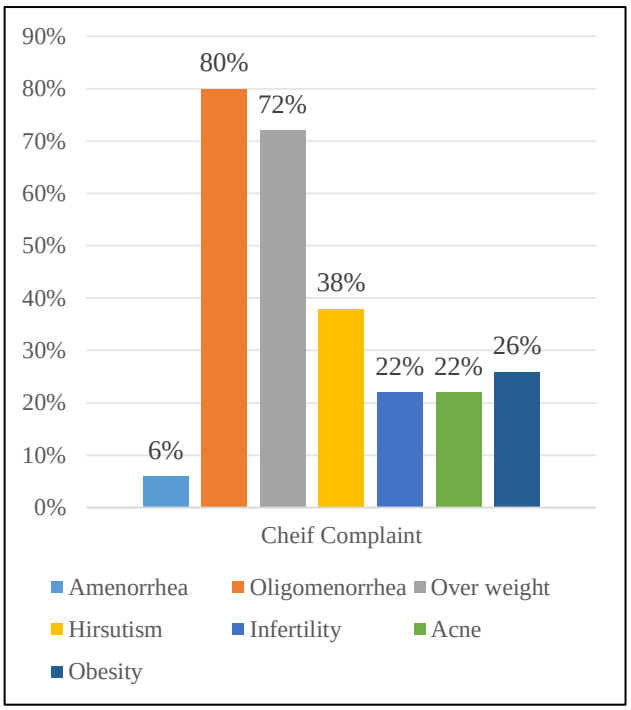

Figure 5: Distribution of chief complaints among the study participants, (n=150).

Figure 5 depicts that overall, most common chief complaint of patients is Oligomenorrhea F/b overweight, 80% and 72% respectively. The 38% patients having hirsutism while 6% having amenorrhea.

The 22% having complaint of being infertile and same percentage also having chief complaint of acne while obesity was complaint of 26% patients.

Table 1: Distribution of menstrual pattern among the study participants, (n=150).

Patterns	Percentage (%)
Regular	13
Irregular	87

Table number 1 suggests that majority population (87%) having irregular menses pattern while rest of having regular menses.

Table 2: The relationship between the Asian BMI cut-offs and acanthosis nigricans (n=150).

Asian BMI cut-offs	Underweight	Normal weight	Over weight	Obese	Significance (p value)
Acanthosis nigricans					
Yes	0	4	10	64	0.006
No	2	24	16	30	

Table 2 showing 64 patients (42.66%) having both obesity and acanthosis nigricans and 10 patients (6.66%) having overweight and acanthosis nigricans. Means nearly 50% (49.32%) patients having more weight than normal associated with acanthosis nigricans.

Table 3: Known association of PCOS.

Category	N	Percentage (%)
Family history of PCOS	33	22
Nulliparity	93	62

Table 3 showing data that 22% patients having family history of PCOS and 62% patients are nulliparous. Above data suggests PCOS having important role of parity and family h/o PCOS.

DISCUSSION

The present study was conducted in women of reproductive age group with PCOS.

Area of residence

In our study around 28% are from rural area and 72% from urban area. The possible reason may be urban population does have sedentary life style and more tendency of obesity. In a study by Sonak et al 34.88% are from rural areas and 65.12% re from urban areas.[30]

Employment status

In our study around 44% are housewives, 48% are students and 8% are working women. This may be due to housewives and students have sedentary life style. In a study by Sonak et al 4.65% have studied till middle school, 15.12% studied till high school, 29.07% have studied till SSC, 23.26% have studied till HSSC and graduates studied till 7.91%.[30]

Socioeconomic status

In our study around 48% are from middle socioeconomic status and 44% from upper socioeconomic status. Because present study was a hospital-based study and being a cost effective private setup and city surroundings being rural population, majority of study participants were from rural population. In a study by Sonak et al 15.12% are from lower class, 11.63% from lower middle class, 13.95% from middle class, 23.26% from upper middle class and 36.05% from upper class.[30]

Symptoms

In our study about 80% oligomenorrhea, 72% overweight, 38% are having hirsutism, 23% acne, 26% obesity, 21% infertility, 6% amenorrhea.

Feature of insulin resistance like acanthosis nigricans was present in 52%. Oligomenorrhea and overweight was major complaints for seeking help in hospital. In Sonak et al 42 (48.84%) subjects had hirsutism, of them 32 (37.21%) subjects had hirsutism score between 9 to 15 whereas 10 (11.63%) subjects had hirsutism score >15 while 44 (51.16%) subjects had normal (≤8) hirsutism scores with a p=0.779 which was statistically insignificant.[30]

The current study detected a significant association between high BMI categories and the presence of Acanthosis nigricans which is an indicator of insulin resistance. Thus, addressing overweight and obesity might in turn will improve the detrimental metabolic parameters which will improve the long-term outcome of PCOS patients.

Family history of PCOS

In our study around 22% had family history of PCOS and metabolic illness like DM and HTN. In Sonak et al the 28 (32.5%) subjects had a family history of DM and HTN, 39 (45.35%) subjects had abnormal hair growth patterns.[30]

Menstrual pattern

About 87% have irregular menstrual pattern. In Sonak et al dysmenorrhea (37.21%) was the most common presenting illness followed by amenorrhea (30.23%).[30]

PCOS remains as a significant health burden due to the associated metabolic, psychological and reproductive complications. The current study has demonstrated that 80% of the study group had their weight in the over-weight or obese category according to the Asian BMI cut-offs[31.]

CONCLUSION

The current study found that most of the participants were overweight and obese based on BMI cut-offs, suggesting a concerning rise in metabolic complications among PCOS patients in the future. The disease is most commonly identified by the presence of clinical or biochemical signs of excess androgens and irregular menstrual cycles, rather than the observation of polycystic ovaries on transvaginal ultrasound. This highlights the significance of clinical suspicion and diagnosis in detecting the disease. Having a higher BMI is linked to having acanthosis nigricans, emphasizing the significance of losing weight to reduce insulin resistance and prevent fatty liver in PCOS patients. Effectively managing the illness will ultimately alleviate the nation's future healthcare cost burden.

Recommendation

Future research, such as multi-center, prospective studies, will aid in comprehending the clinical characteristics and effective treatment of the condition.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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