

Original Research Article

A cross sectional study of polycystic ovarian syndrome among young women in Bhopal, Central India

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ABSTRACT

Background: Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder among women of reproductive age groups. It is one of the leading causes of poor fertility. Risk factors include obesity, not enough physical exercise, and a family history. Most studies in India report prevalence of PCOS as 9.13% to 36%. Behaviour and life style modifications are important part of treatment for PCOS. A number of cases in the community due to lack of awareness and proper guidance, it remains undiagnosed. Aim of this study was to find the prevalence of PCOS among the young females of Bhopal city. Thus, risk assessment in the form of a survey would be one of the strategies to identify this syndrome early so as to encourage young women to seek timely treatment and prevent its long term complications.

Methods: Non comparative cross sectional study for duration of 8 month.

Results: The prevalence of PCOS in this study was 8.20%. Among all the risk factors, BMI ≥ 25 (P value < 0.0001) and waist hip ratio ≥ 0.85 (< 0.0001) were strongly associated with the presence of PCOS and Lack of awareness, there were in girls (78.4%).

Conclusions: Women who were having BMI ≥ 25 and waist hip ratio ≥ 0.85 should be educated about its complications and should be advised weight loss. Girls who had irregularity of menses and signs of hyperandrogenism should be investigated and must be managed accordingly. Early diagnosis of PCOS and its prompt treatment will help the girls to improve quality of life.

Keywords: PCOS, Women, Bhopal

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder among women of reproductive age groups and is defined as a hormonal disorder characterized by the presence of at least one polycystic ovary (presence of multiple cysts) accompanied by ovulatory dysfunction and excessive secretion of androgens.¹ PCOS is a major public health

concern in terms of a frustrating experience for women and a challenging complex syndrome for clinicians.² Globally, prevalence estimates of PCOS are highly variable, ranging from 2.2% to as high as 26% of this age group depending on how it is defined.³ These variations are due to difficulties in hormonal evaluation and lack of consensus on diagnostic criteria.³ It is one of the leading causes of poor fertility.⁴ PCOS is associated with a wide spectrum of presenting features, including anovulation,

obesity and abnormal facial and skin hair growth (hirsutism).^{5,6} Women with PCOS are at an increased risk for infertility, preeclampsia, early pregnancy loss, and endometrial cancer. Moreover, because of the association of PCOS with insulin resistance, evidence suggests that women with PCOS are at an increased risk for developing type-2 diabetes, dyslipidemia, hypertension, and heart disease.⁷ The cysts are not harmful but lead to hormone imbalances.⁸ Risk factors include obesity, not enough physical exercise, and a family history of someone with the condition during this pubertal transition, several features may be in evolution and thus many findings may be transitory which stabilize later during adolescence.⁹ Most studies in India report prevalence of PCOS as 9.13% to 36%. This limits large epidemiological studies in the community. However, it is important to make an early diagnosis in order to prevent early and late sequel of the syndrome.³ Early diagnosis and treatment can help control the symptoms and prevent long-term problems.¹⁰ There is no cure for PCOS, but controlling it lowers risks of infertility, miscarriages, diabetes, heart disease, and uterine cancer.¹¹ Behaviour and life style modifications are important part of treatment for PCOS.¹¹ Women's with this peculiar syndrome experiences complex of symptoms including distress, depression, anxiety which affect quality of life of patients and definitely accounts for significant healthcare costs.¹² Diagnosis of PCOS is now largely based on the Rotterdam criteria, which are inclusive of the original National Institutes of Health (NIH) criteria and require two of three key features: oligo- or anovulation, clinical and/or biochemical hyperandrogenism and polycystic ovaries on ultrasound.¹³ In approximately 20% of the cases, it may be incidentally found on ultrasound examination in asymptomatic patients.¹⁴ In most of time dilemma of diagnosis and treatment modalities exists. Each time they get treated for isolated morbidities, further delaying the diagnosis and complicating the treatment of this multidimensional syndrome. Sometimes the journey to a diagnosis of PCOS is a long and frustrating one, being diagnosed with the PCOS can generate a range of feelings and emotions, often these are similar to a grief reaction.¹⁵ A number of cases in the community due to lack of awareness and proper guidance, it remains undiagnosed.¹⁶ Aim of this study was to find the prevalence of PCOS among the young females of Bhopal city. Thus, risk assessment in the form of a survey would be one of the strategies in the dimensions of community medicine to identify this syndrome early so as to encourage young women to seek timely treatment and prevent its long term complications. The first step to managing PCOS is to impart awareness and understanding.

The principle objectives of the research were to find out the prevalence, to assess the knowledge and to study the risk factors associated with PCOS among young females of Bhopal city.

METHODS

Present study was a non-comparative cross sectional study for duration of 8 month from September 2014 to April 2015. 500 girls of age group of 17-24 years studying girl's colleges in different quadrants of Bhopal city in Madhya Pradesh, India were interviewed with their consent by screening questionnaire. After screening for PCOS, all suspected girls were confirmed by USG.

Sample size

Sample size was calculated as 385 with an estimated prevalence of 10%, precision of 3%, and confidence interval of 95%. We added 20% for non-responders making the total number to 462(500). Using a systematic multistage random sampling method is adopted. Approval was taken from the Institutional Ethics Committee.

Inclusion criteria

Girls aged 17-24 years, who had attained menarche more than 2 years before the study and were willing to participate in the study were enrolled

Exclusion criteria

Those who were known case of thyroid disorders, Cushing's syndrome, and who were not willing to participate were excluded from this study.

Data collection and procedure

As there is no universally accepted validated tool available for making clinical diagnosis of PCOS, A structured self-administrative questionnaire was developed with the aid of available evidences by the researchers for data collection to fully meet the demands of this research. Pilot study was conducted among 10% of total respondents, before undertaking the major study to test the interview schedule and to assess any constraints that could arise and would need to be addressed during this study.^{17,18} The developed questionnaire are corrected, revised and validated by public health experts and clinicians. After that the developed questionnaire are revised by researchers and then has been translated into Hindi language. It was pretested before its use in this study. This tool contained questionnaire includes the following component-knowledge assessment, anthropometric assessment, clinical history, menstrual history, hirsutism/androgen production assessment (skin problems, and hair distribution) and polycystic ovary assessment. Final diagnosis of PCOS was made if all three elements of Rotterdam criteria were present which included presence of oligomenorrhea after two years of menarche or primary amenorrhea at the age of 16 years, and polycystic ovaries on ultrasound along with ovarian size of more than 10 cm and hyperandrogenemia should be present. Hirsutism score of more than 8 was

considered positive for hyperandrogenemia. An informed written consent was obtained prior to conducting the study. In case an individual being lesser than 18 years, consent was obtained from the parent/guardian. After taking permission from the school/college authority, the teachers were explained the purpose of the study and rapport was built up among them. Briefing was done to them regarding the questionnaire provided to them. Care was taken to ensure privacy and confidentiality. The developed questionnaire was used to length of menstrual cycle, sign of androgen excess (skin problems, hair distribution) and anthropometric measurements such as weight, height, waist circumference, hip circumference, body mass index (BMI). Overweight was defined as a BMI between 25.0 and 29.9, and obese as 30.0 or higher according to World Health Organization categories.¹⁹

Statistical analysis

Each completed questionnaire was coded on pre-arranged coding by the principal investigator to minimize errors. Data were analyzed using excel, windows 2007 and using a software (epi info 7). The Chi-square test was used, the significance of the results was computed at the level of $p < 0.05$.

RESULTS

Total 500 college girls were included in the study. It was evident that the mean age of the study subjects who were

studied was 18.47 ± 0.482 years, while their age range was 17-24 years. More than 97 percent of the respondents were currently unmarried. Table 1 showed, 19 (3.80%) girls had oligo/anovulation, 8 (1.60%) girls had hirsutism (hyperandrogenic manifeststion), 29 (5.80%) girls had both oligo/anovulation and hirsutism, in 409 (81.80%) girls acne were present and 103 (20.60%) girls had complain of hair fall. A total of 56 probable cases were identified. On further evaluation of these probable cases, 41 (8.2%) were diagnosed with PCOS as per the Rotterdam criteria (Table 2).

The phenotypes of PCOS observed in this study are as follows:

- Subjects with oligomenorrhoea and polycystic ovaries, 7 (1.40%)
- Subjects with hirsutism and polycystic ovaries, 5 (1%)
- Subjects with oligomenorrhoea and hirsutism, 29 (5.80%)

Overall 41 (8.20%) girls had PCOS according to Rotterdam criteria. Thus, the prevalence of PCOS in this study was 8.20%. Among all the risk factors, BMI ≥ 25 (P value < 0.0001) and waist hip ratio ≥ 0.85 (< 0.0001) were strongly associated with the presence of PCOS as shown in Table 3 and lack of awareness (health seeking behavior), there were in girls (78.4%) about PCOS as shown Figure 1.

Table 1: Distribution of respondents according to endocrinological abnormalities.

S. No.	Endocrinological abnormalities	Present No (%)	Absent No (%)	Total (%)
1	Irregular mensus/oligo/anovulation only	19 (3.80)	481 (96.20)	500 (100)
2	Hirsutism only	8 (1.60)	492 (98.40)	500 (100)
3	Irregular mensus/oligo/anovulation and hirsutism	29 (5.80)	471 (94.20)	500 (100)
4	Acne	409 (81.80)	91 (18.20)	500 (100)
5	Hair loss/alopecia	103 (20.60)	397 (79.40)	500 (100)

Table 2: Prevalence of PCOS according to Rotterdam criteria.

S. No.	PCOS variables	PCOS present (according Rotterdam criteria) (%)
1	Irregular mensus/oligo/anovulation and hirsutism	29 (5.80)
2	Irregular mensus/oligo/anovulation and multiple cyst in ovary	7 (1.40)
3	Hirsutism and multiple cyst in ovary	5 (1)
Total	N=500	41 (8.20)

Table 3: Association between PCOS and other variables.

Variables		PCOS present (%)	PCOS absent (%)	Total (%)	P value
Age (in years)	<20	37 (7.4)	411 (82.2)	448 (89.6)	NS
	>20	4 (0.8)	48 (9.6)	52 (10.4)	
BMI	< 25	3 (0.6)	407 (81.4)	410 (82.0)	P= < 0.0001
	≥ 25	38 (7.6)	52 (10.4)	90 (18.0)	
Waist/hip ratio	<0.85	4 (0.8)	423 (84.6)	427 (85.4)	P= < 0.0001
	≥ 0.85	37 (7.4)	36 (7.2)	73 (14.6)	
Total		41	459	500	

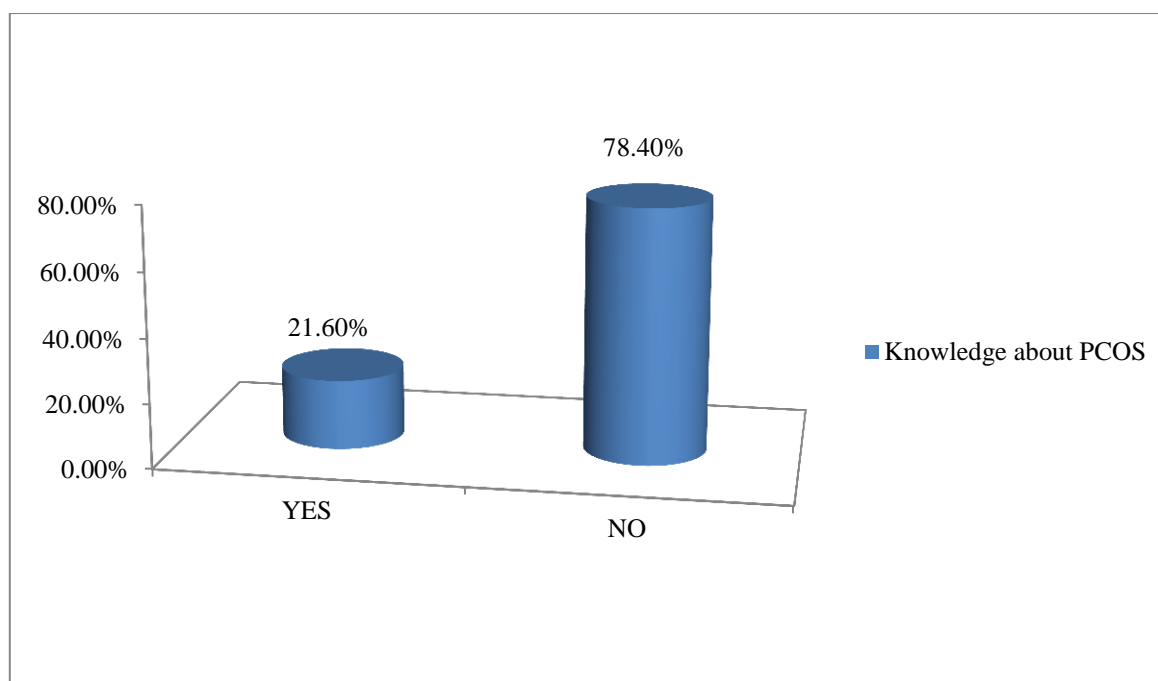


Figure 1: Knowledge about PCOS.

DISCUSSION

This study investigated the phenotype profile and the prevalence of PCOS among young female students in the age group of 17–24 years. Such findings will be discussed in the following paragraphs. Through our study we found the prevalence of polycystic ovarian syndrome in the Bhopal (central India) to be 8.2%. This estimate is close to the 9.13% reported by Nidhi et al.²⁰ Findings are in agreement with study of Shetty (10%), Choudhary et al (9.13%), Vaidya et al (3.4% of women).^{21,22} Joshi et al found that globally, prevalence estimates of PCOS are highly variable, ranging from 2.2% to as high as 26%.³ Another study conducted in Mumbai (India) showed prevalence of 11.97%. Using same criteria for diagnosis the prevalence of the disorder when compared with previous studies carried out in the American and European continents was observed to be much less than that among Asian-Indian women. A study conducted at the University of Alabama at Birmingham, USA consisting of 400 samples reported the prevalence of the syndrome to be 6.6%, whereas a study among Caucasian women from Spain (sample size of 154) reported a prevalence of 6.5%. Others are in are Australia 8.7%, Greek Island of Lesbos 6.7%, the southeastern United States 4%, and Sweden 4.8%.²³⁻²⁷ Therefore, a clear distinction in prevalence of PCOS can be observed based on the ethnicity of the populations being studied and a conclusion can be made that ethnicity is an important factor in the manifestation and prevalence of the disorder.^{28,29} In our study BMI and Waist Hip ratio were strongly associated with the presence of PCOS. Findings in present study showed risk of PCOS higher in Obese which is similar to study done by Saxena et al, Blasco et al, Sanchez N et al, Majumdar et al and study of Yildiz

et al.³⁰⁻³⁴ In present study lack of awareness were found among majority of girls (78.4%), these findings are in agreement with other study of Sunanda et al, Sowmya et al and Hadayat A et al.³⁵⁻³⁷

CONCLUSION

From this study, it is concluded that only 21.6% of girls were aware of PCOS. Prevalence of PCOS in present study is 8.2% (95% confidence interval: 5.8–10.6%). Girls who were having BMI ≥ 25 (P value < 0.0001) and waist hip ratio ≥ 0.85 (< 0.0001) should be educated about its complications and should be advised weight loss. Girls who had irregularity of menses and signs of hyperandrogenism should be investigated and must be managed accordingly. Early diagnosis of PCOS and its prompt treatment will help the girls to improve quality of life.

Recommendations

- More such multi centric studies should be conducted to find out more PCOS cases so that complication later in life due to PCOS will be prevented.
- Health education should be included in the curriculum which will provide an awareness towards the disorder, lifestyle modification and dietary habits
- There is a need for intensified efforts in early detection and periodic monitoring more so in obese.

Limitations of the study

The cross-sectional design of this study does not allow causal conclusions, and as such, the interpretability of our findings is limited. Only a limited number of patients

turned up for USG. Other blood investigations to diagnose (such as serum testosterone levels) or to rule out (such as serum prolactin) PCOS could not be done due to economic constraints.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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