



Clinical Profile of Infertile PCOS Women Attending in BSMMU

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ABSTRACT:

Background: Polycystic ovary syndrome (PCOS) is a leading endocrine disorder and major cause of female infertility, characterized by heterogeneous clinical presentations. Understanding the specific profiles of infertile women with PCOS in different populations is crucial for timely diagnosis and effective management. This study aimed to evaluate the clinical and hormonal profiles of infertile women diagnosed with PCOS who attended the infertility clinic at Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh.

Methods: This cross-sectional observational study was conducted at the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh, from January 2007 to December 2007. A total of 100 women with PCOS and infertility were included. Data were collected through interviews, physical examinations, hormonal assays (LH, FSH, and testosterone), and transvaginal sonography. Descriptive and inferential statistical analyses were conducted using SPSS version 25.0, with a significance level set at $p \leq 0.05$.

Results: Secondary infertility was more prevalent (72%) than primary infertility (36%) in this study. Oligomenorrhea was observed in 60% of the participants, and 44% exhibited hirsutism. Obesity was present in 42% of patients, while 46% had a normal body mass index (BMI). An LH: FSH ratio $>1:3$ was found in 56% of patients, and elevated serum testosterone levels were observed in 30% of patients. Polycystic ovarian morphology on transvaginal sonography was detected in 52% of the patients.

Conclusion: Infertile women with PCOS at BSMMU exhibit a broad spectrum of clinical and hormonal features, with oligomenorrhea, obesity, and hyperandrogenism being dominant. These findings highlight the need for individualized and culturally tailored management strategies.

Introduction

Polycystic ovary syndrome (PCOS) is very common among women in their reproductive years and is the main reason for infertility in many women worldwide. PCOS is marked by the reproductive problems of ovulatory dysfunction, high levels of androgens and the presence of many cysts in the ovaries, and its causes include various genes, hormones and exposures from the environment [1,2]. The Rotterdam criteria, which call for two of three key features (oligo/anovulation, hyperandrogenism and polycystic

ovaries on ultrasound), are the most widely used for diagnosing PCOS [3].

Infertility, which is a big issue with PCOS, affects about 70–80% of those diagnosed [4]. Most cases are linked to regular periods of not ovulating, but other aspects, such as hormone levels and insulin resistance, are involved too [5]. Some of the clinical signs of PCOS in women are irregular or absent periods, weight gain, too much facial hair, acne, and they present more or less often in different groups of people [6,7]. This diversity of symptoms shows why it is vital to



conduct local research to improve our understanding of affected women's needs.

In Bangladesh, as well as in South Asia as a whole, PCOS-related fertility issues are widespread but poorly recognized. Local investigations suggest that many infertile women with PCOS are affected by metabolic problems and too much androgen (male hormone) [8,9]. On the other hand, we find hardly any detailed information collecting the clinical and hormonal profiles of these patients in modern tertiary hospitals. To make an early and appropriate diagnosis, proper treatment, and offer reproductive advice, the clinical pattern must be recognized.

Many international studies have pointed out the main differences in PCOS cases and their impact on fertility results. Chen et al. discovered that problems with metabolism are closely related to negative reproductive outcomes in PCOS women [10]. In addition, a study by Elsayed and others describes how patients with PCOS can experience a variety of clinical signs, which may change how effective treatments are and how fertility succeeds [7]. What is more, Guo et al. found that there are significant differences in hormone and lipid levels among PCOS subtypes, which suggests it may be necessary to tailor therapy to each person [11]. While such findings are few in Bangladesh.

The emotional and social challenges that can come with PCOS-related infertility are very serious as well. Patients on HRT have consistently shown more depression and emotional stress, and their overall quality of life is reduced [12,13]. To manage this condition well, one needs to understand both its medical aspects and how the patient feels, and this starts by creating a thorough clinical profile.

Because of the wide variety of symptoms and the effect PCOS can have on fertility, we need more studies focused on specific areas. This study is focused on filling this gap by examining the medical conditions, hormone levels and ultrasound results of infertile women with PCOS who come to the infertility outpatient department at BSMMU. Results will help describe how this population's phenotypes are distributed and lead to better targeted care.

Objective

The objective of this study was to find out the clinical presentation of patients with PCOS.

Methodology & Materials

This cross-sectional observational study was conducted at the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from January 2007 to December 2007. A total of 100 infertile women diagnosed with polycystic ovary syndrome (PCOS) were enrolled in the study to evaluate their clinical and biochemical profiles.

Inclusion Criteria:

1. Women aged 20–40 years.
2. Diagnosed with PCOS based on the Rotterdam criteria (at least two of the following: oligo/anovulation, clinical/biochemical hyperandrogenism, polycystic ovaries on ultrasound).
3. Presenting with infertility for at least 1 year.

Exclusion Criteria:

1. Women with other known causes of infertility (e.g., tubal blockage, male factor infertility).
2. Known endocrine disorders such as hyperprolactinemia or thyroid dysfunction.
3. History of pelvic surgery or chemotherapy.
4. Use of hormonal medication within the past 3 months.

Data Collection Procedure: Data were collected through structured interviews, clinical examinations, laboratory tests, and ultrasonography. Information regarding menstrual history, body mass index, hirsutism, and infertility type was obtained. Hormonal assays, including serum LH, FSH, and testosterone levels, were performed in a certified laboratory. Transvaginal ultrasound was used to assess ovarian morphology. All data were recorded in pre-designed forms by trained medical personnel to ensure consistency and reliability.

Ethical Consideration: Ethical approval was obtained from the Institutional Review Board of BSMMU. Written informed consent was taken from all participants after explaining the purpose, procedures, potential risks, and benefits of the study. Participant confidentiality was strictly maintained throughout the research.

Statistical Analysis: Statistical analysis was conducted using SPSS version 25.0. Descriptive statistics, such as frequency and percentage, were used for categorical



variables. Inferential statistics, including chi-square tests and t-tests, were applied to explore associations where appropriate. A p-value of ≤ 0.05 was considered statistically significant.

Results

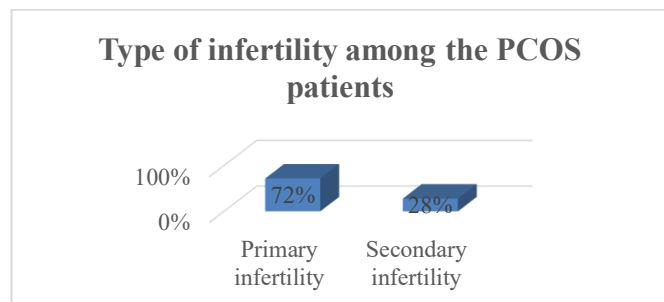


Figure 1: Prevalence and type of infertility among the PCOS patients (n=100)

Figure 1 displays the distribution of infertility types. Among the 100 PCOS patients studied, 72% had primary infertility, and 28% had secondary infertility. This indicates a predominance of primary infertility in this population.

Table 1: Clinical presentation of PCOS patients (n=100)

Clinical presentation	Number of patients	Percentage (%)
Oligomenorrhoea	60	60
Amenorrhoea	18	18
Normal cycle	22	22
Obese	42	42
Thin	12	12
Normal BMI	46	46
Hirsutism	44	44

Table 1 outlines the clinical features observed among PCOS patients. The most common menstrual irregularity was oligomenorrhoea, affecting 60% of participants, followed by amenorrhoea in 18%. Only 22% had a normal menstrual cycle. Regarding body habitus, 42% of patients were obese, 12% were classified as thin, and 46% had a normal BMI. Hirsutism was reported in 44% of the cohort, indicating a high prevalence of hyperandrogenic symptoms.

Table 2: Clinical Characteristics and Menstrual Patterns of Infertile PCOS Patients (n=100)

Investigations	Number of patients (n)	Percentage (%)	
Serum FSH	LH>1:3	56	56
	LH>1:2	36	36
	Normal	8	8
Transvaginal sonography	Positive feature of PCOS	52	52
	Normal	48	48
Serum testosterone	High	30	30
	Normal	70	70

Table 2 summarizes the findings from laboratory and imaging evaluations. LH:FSH ratios greater than 1:3 was observed in 56% of patients, while 36% had a ratio above 1:2, and only 8% had normal levels. Transvaginal sonography revealed polycystic ovarian morphology in 52% of cases, whereas 48% showed normal ovarian appearance. Elevated serum testosterone levels were noted in 30% of the participants, supporting the diagnosis of hyperandrogenism in a significant subset.

Discussion

This study was conducted to determine what clinical and hormonal features are seen in infertile PCOS patients treated at a tertiary center in Bangladesh. It is shown in the study that women with PCOS usually have oligomenorrhoea, obesity, hirsutism and abnormal LH:FSH ratios. These outcomes are similar to results found elsewhere, yet there are specific differences linked to ethnicity, lifestyle and availability of medical treatment.

In this study, we found that 72% of cases were primary infertility, which is in agreement with research showing that in nulliparous women, PCOS is common for making ovulation hard or impossible. The observation here agrees with He et al., who mentioned that irregular ovulation is often the initial sign of PCOS and results in primary infertility [14]. It looks like women who conceive naturally but then encounter fertility challenges often go without treatment or are simply not diagnosed, which is noticeable in resource-limited areas [13].



About 60% of patients experienced irregular periods, and amenorrhoea was reported in 18% of cases. Such patterns match Zawadeski and Dunai's description of how ovaries do not function properly in PCOS [1]. Also, because more than half (42%) of these women were obese, the connection with problem menstruation supports the idea that insulin resistance can make both problems worse [15].

Almost half (44%) of the participants experienced Hirsutism, suggesting there was a high rate of clinical hyperandrogenism among them. This agrees with what Lobo et al. pointed out in their study: peripheral androgen activity causes hirsutism for many women with PCOS [16]. Among our study population, having more than normal testosterone in the blood, found in 30% of cases, suggests biochemical hyperandrogenism, although this rate is not as high as seen in some populations from the West, which might be due to differences in how androgen symptoms and treatment are interpreted among different ethnic groups.

Blood tests showed that over half of the patients had significantly higher LH than FSH, and more than one-third had LH levels higher than two times FSH. The results are in line with what Nestler et al. described as usual for PCOS, in which higher frequency LH pulses raise the level of androgens produced by theca cells within the gonads [17]. Even though they are not a diagnostic tool, high LH: FSH values are common in laboratory findings, especially for lean PCOS women and are used to confirm the diagnosis [18].

About 52% of women had polycystic ovarian morphology, which was slightly less than was anticipated. This might happen because some techniques used for imaging are limited, or people apply different ideas while interpreting ultrasound results. Falsetti and Eleftheriou underlined that a lack of sonographic findings can be seen among women with milder or early stages of PCOS [19].

It is worth mentioning that while a large part of the patients was obese (42%), a notable portion (46%) were at a healthy weight, and only a few (12%) were thin. Such diversity demonstrates the variety of PCOS cases, as written by Elsayed et al., who assigned PCOS individuals to various subtypes with different levels of metabolic disturbance [7]. According to these studies, only a few PCOS patients truly fall into the obesity category. The results thus urge doctors to give more attention to normal-weight PCOS.

The different symptoms noted show that each patient should be handled individually. Alawad et al. indicate that hormonal abnormalities are more pronounced in infertile PCOS patients compared to their fertile peers, so hormone screening should be performed early in reproductive-age women with menstrual disorders [8].

PCOS is also frequently connected to a high risk of metabolic issues. Two reports from Talbott et al. and Conway et al. revealed that women with PCOS struggling with central obesity and insulin resistance have an increased risk of cardiovascular disease and type 2 diabetes [20, 21]. Not focusing on metabolic parameters left some concerns regarding the long-term health risks that come from obesity and high androgens.

According to the work of Elsenbruch et al. and Eggers and Kirchengast, poor quality of life and greater psychological distress are common in PCOS patients dealing with infertility [22, 23]. These are important factors, even though they weren't directly examined in this study, and they support including mental health services when caring for people with PCOS.

This research supports the need to profile PCOS at the individual or community level. Since symptoms can change from area to area, creating local phenotypic patterns will help improve screening and treatment. Looking into metabolic indicators, psychological check-ups, and the results of treatment can help provide a complete view of PCOS in Bangladeshi women.

Limitations and recommendations

This study was limited by its single-center design and lack of metabolic and psychosocial evaluations, which are critical to the PCOS spectrum. Hormonal assays were limited to a few markers, with no longitudinal follow-up or treatment outcomes assessed. Future research should incorporate larger multicenter cohorts and explore metabolic, inflammatory, and psychological parameters. Additionally, evaluating treatment responses across PCOS phenotypes could enhance patient care. Routine screening and counselling should be emphasized in resource-limited settings to ensure timely diagnosis, reduce infertility burden, and improve quality of life for women with PCOS.



Conclusion

This study highlights the clinical heterogeneity of PCOS in infertile women at a tertiary care center in Bangladesh. Most participants (72%) experienced primary infertility, with common symptoms including oligomenorrhea, hirsutism, and obesity. Hormonal abnormalities, such as elevated LH:FSH ratios and testosterone levels, were frequent. These findings emphasize the importance of early screening and individualized assessment of PCOS phenotypes for timely infertility management. The observed patterns offer insights into regional variations in PCOS expression and can inform targeted reproductive healthcare interventions in South Asian populations.

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Conflicts of interest

There are no conflicts of interest.

Ethical approval

The study was approved by the Institutional Ethics Committee.

References

1. Zawadeski JK, Dunaif A. Diagnostic criteria for PCOS: towards a more rational approach. PCOS. Boston: Blackwell Scientific. 1992:377-84.
2. Franks S. Polycystic ovary syndrome. New England Journal of Medicine. 1995 Sep 28;333(13):853-61.
3. Legro RS, Driscoll D, Strauss III JF, Fox J, Dunaif A. Evidence for a genetic basis for hyperandrogenemia in polycystic ovary syndrome. Proceedings of the National Academy of Sciences. 1998 Dec 8;95(25):14956-60.
4. Banu J, Fatima P, Sultana P, Chowdhury MA, Begum N, Anwary SA, Ishrat S, Deebea F, Begum SA. Association of infertile patients having polycystic ovarian syndrome with recurrent miscarriage. Mymensingh Medical Journal: MMJ. 2014 Oct 1;23(4):770-3.
5. Dunaif A. Insulin resistance and the polycystic ovary syndrome: mechanism and implications for pathogenesis. Endocrine reviews. 1997 Dec 1;18(6):774-800.
6. Kim JJ, Hwang KR, Choi YM, Moon SY, Chae SJ, Park CW, Kim HO, Choi DS, Kwon HC, Kang BM, Lee BS. Complete phenotypic and metabolic profiles of a large consecutive cohort of untreated Korean women with polycystic ovary syndrome. Fertility and sterility. 2014 May 1;101(5):1424-30.
7. Elsayed, A., Al-Kaabi, L., Al-Abdulla, N., Al-Kuwari, M., Al-Mulla, A., Al-Shamari, R., Alhusban, A., Alnajjar, A., & Doi, S. (2023). Clinical Phenotypes of PCOS: a Cross-Sectional Study. *Reproductive Sciences*, 30, 3261 - 3272.
8. Alawad FH, Alharbi AA, Mayoof KI, Hawsawi HM, Alharthi NN, Ahmed RA. Comparative Retrospective Analysis of Clinical and Hormonal Profiles in PCOS Patients with and Without Infertility. *Journal of Advanced Trends in Medical Research*. 2024 Apr 1;1(2):513-8.
9. Naumova I, Castelo-Branco C, Kasterina I, Casals G. Quality of life in infertile women with polycystic ovary syndrome: a comparative study. *Reproductive Sciences*. 2021 Jul;28(7):1901-9.
10. Chen H, Zeng R, Zeng X, Qin L. Cluster analysis reveals a homogeneous subgroup of PCOS women with metabolic disturbance associated with adverse reproductive outcomes. *Chinese Medical Journal*. 2024 Mar 5;137(05):604-12.
11. Guo F, Gong Z, Fernando T, Zhang L, Zhu X, Shi Y. The lipid profiles in different characteristics of women with PCOS and the interaction between dyslipidemia and metabolic disorder states: a retrospective study in Chinese population. *Frontiers in Endocrinology*. 2022 Jul 4;13:892125.
12. Elsenbruch S, Benson S, Hahn S, Tan S, Mann K, Pleger K, Kimmig R, Janssen OE. Determinants of emotional distress in women with polycystic ovary syndrome. *Human Reproduction*. 2006 Apr 1;21(4):1092-9.
13. Schmid J, Kirchengast S, Vytiska-Binstorfer E, Huber J. Infertility caused by PCOS—health-related quality of life among Austrian and Moslem immigrant women in Austria. *Human reproduction*. 2004 Oct 1;19(10):2251-7.
14. He S, Mao X, Lei H, Dong B, Guo D, Zheng B, Sun P. Peripheral blood inflammatory-immune cells as a predictor of infertility in women with polycystic ovary syndrome. *Journal of Inflammation Research*. 2020 Aug 18:441-50.
15. Sozen I, Arici A. Hyperinsulinism and its interaction with hyperandrogenism in polycystic



- ovary syndrome. *Obstetrical & gynecological survey*. 2000 May 1;55(5):321-8.
16. LOBO RA, GOEBELSMANN U, HORTON R. Evidence for the importance of peripheral tissue events in the development of hirsutism in polycystic ovary syndrome. *The Journal of Clinical Endocrinology & Metabolism*. 1983 Aug 1;57(2):393-7.
 17. Nestler JE, Powers LP, Matt DW, Steingold KA, Plymate SR, Rittmaster RS, Clore JN, BLACKARD WG. A direct effect of hyperinsulinemia on serum sex hormone-binding globulin levels in obese women with the polycystic ovary syndrome. *The Journal of clinical endocrinology & metabolism*. 1991 Jan 1;72(1):83-9.
 18. Dunaif A, Segal KR, Futterweit W, Dobrjansky A. Profound peripheral insulin resistance, independent of obesity, in polycystic ovary syndrome. *Diabetes*. 1989 Sep 1;38(9):1165-74.
 19. Falsetti L, Eleftheriou G. Hyperinsulinemia in the polycystic ovary syndrome: a clinical, endocrine and echographic study in 240 patients. *Gynecological endocrinology*. 1996 Jan 1;10(5):319-26.
 20. Talbott E, Guzick D, Clerici A, Berga S, Detre K, Weimer K, Kuller L. Coronary heart disease risk factors in women with polycystic ovary syndrome. *Arteriosclerosis, thrombosis, and vascular biology*. 1995 Jul;15(7):821-6.
 21. Conway GS, Agrawal R, Betteridge DJ, Jacobs HS. Risk factors for coronary artery disease in lean and obese women with the polycystic ovary syndrome. *Clinical endocrinology*. 1992 Aug;37(2):119-25.
 22. Elsenbruch S, Hahn S, Kowalsky D, Offner AH, Schedlowski M, Mann K, Janssen OE. Quality of life, psychosocial well-being, and sexual satisfaction in women with polycystic ovary syndrome. *The Journal of Clinical Endocrinology & Metabolism*. 2003 Dec 1;88(12):5801-7.
 23. Eggers S, Kirchengast S. The polycystic ovary syndrome—a medical condition but also an important psychosocial problem. *Collegium antropologicum*. 2001 Dec 17;25(2):673-85.