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A 2026 updated review on polycystic ovary syndrome in Bangladeshi women: From characterization to intervention

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Abstract

A significant number of scientific articles about polycystic ovary syndrome (PCOS) are being published globally. Publications on PCOS from Bangladesh cover various disciplines and types, including review articles and case reports. A narrative review of the published original articles on Bangladeshi women with PCOS was released in January 2023. In this review, we included only original articles published since 2023. Additionally, some articles missing from the previous review, especially those related to intervention studies, were incorporated. We summarized the original articles' findings narratively. *[J Assoc Clin Endocrinol Diabetol Bangladesh,* January 2026; 5(1): *45-59]*

Keywords: Polycystic ovary syndrome, Bangladesh

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Introduction

Polycystic ovary syndrome (PCOS) remains the most common yet poorly understood reproductive endocrinopathy worldwide. Data from the 'Global Burden of Disease Study 2021' showed a doubling in incidence, prevalence, and disability-adjusted life years over the past three decades, mainly affecting adolescents.[1, 2] As a result, PCOS has become a primary focus of research globally. However, most studies have been conducted in developed countries. Overall, Bangladeshi researchers contributed less than 1% of the world's endocrine research according to a PubMed search. Nonetheless, their contributions nearly doubled in the last decade.[3] Between 2012 and 2021, fewer than 10 articles on PCOS from Bangladesh were published in journals indexed in Web of Science.[4]

A summary of all published studies on PCOS from Bangladesh will help readers quickly gain an overall understanding. This time-saving article also allows researchers to find out the research gap on PCOS from a Bangladeshi perspective. A narrative review published in January 2023 described 41 articles published between 2011 and 2022.[5] Our review article will focus only on original articles published after 2022 and will build on the previous review. We also included findings from unreported interventional studies and those missed in the last review.

Methods

We searched PubMed, BanglaJol, ResearchGate, and Google Scholar Lab using the following keywords: 'Polycystic Ovary Syndrome' or 'Polycystic Ovarian Syndrome' or 'PCOS' or 'PCOD' AND Bangladesh, without any time or type limitations, up to 30 November 2025. All article abstracts were reviewed, and relevant original articles authored by at least one Bangladeshi author were included in this review. Duplications, review articles, case reports, editorials, and other types of articles, as well as articles described in previous reviews, were excluded. In the absence of a full article, we extracted data from the abstract. The articles' findings were presented through tabulations, figures, and narrative descriptions, organized into distinct topics. Different articles used different cut-offs to define a condition; however, we did not include them to avoid complicating the tables. We request our readers to read the specific article to learn more about the cut-offs used.

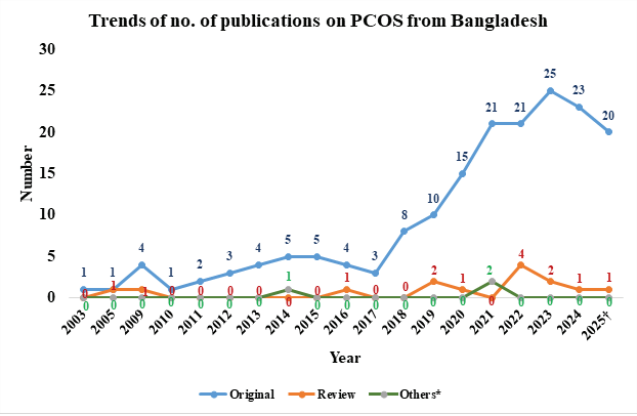
Results

A. Overall characteristics:

The year-wise publication numbers are shown in Figure-1. We identified a total of 193 articles. Among them, 176 (91.2%) are original articles and 14 (7.3%) are review articles. Of the 176 original articles, 120 (68.2%) were conducted in government settings, 42 (23.9%) in private settings, and 14 in mixed or other settings (online, chamber). Dr. ABM Kamrul-Hasan was the first author on 13 articles, followed by Prof. Mosammat Rashida Begum, who was the first author on 9 articles. The highest number of articles was published in Mymensingh Medical Journal (n=17), followed by the International Journal of Reproduction, Contraception, Obstetrics and Gynecology (n=15). Since 2017, there has been a trend of an increase in the number of original articles. In the previous review article, 41 were described.[5] After excluding previously described articles (n=41), review articles (n=14), other ineligible articles (case reports, n=1; editorials, n=2), and duplicate publications (n=9), we identified 124 original articles for inclusion in our review (Supplementary File 1).

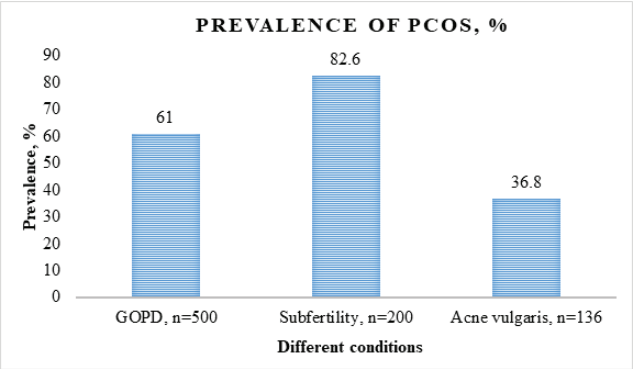
B. Prevalence of PCOS:

PCOS is a prevalent reason (61%) for visiting the Gynecology outpatient department (Khatun et al. 2025), especially those with subfertility (82.6%) (Rahman et al. 2029). It is also a common condition in Dermatology OPD who presented with acne vulgaris (36.8%) (Jesmin et al. 2025) (Figure-2). Anovulation (43%) is the predominant cause of female infertility (Pervin et al. 2022).



*Includes case report and editorial, †Up to November 30, 2025

Figure-1: Frequency of year-wise published articles with types, N=193



Gynecology outpatient department (GOPD)

Figure-2: Prevalence of PCOS in different conditions

C. Reproductive and cutaneous features among Bangladeshi women with PCOS:

Table-Ia, Table-Ib, and Figure-3 summarize the prevalence of reproductive and cutaneous features among Bangladeshi women with PCOS.

a. Irregular cycles:

During reproductive age, irregular cycles are reported in between 25% and 100% of women with PCOS. For those with subfertility, the maximum reported prevalence is 88%. During adolescence, 100% may present with irregular cycles.

b. Significant hirsutism:

Depending on various cut-offs of the modified Ferriman-Gallwey score, up to 97.5% of women with PCOS may present with significant hirsutism.

c. Polycystic ovarian morphology (PCOM):

A minimum of 16% to a maximum of 100% women with PCOS may present with PCOM.

d. Acne and acanthosis nigricans (AN):

Up to 80% women with PCOS may present with acne,

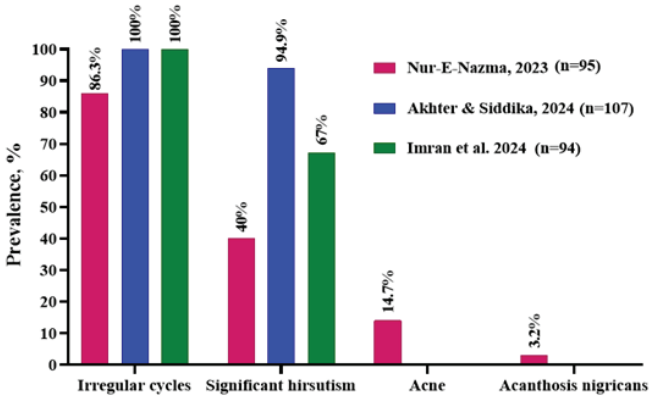


Figure-3: Recent studies reporting the prevalence of reproductive and cutaneous features among adolescent girls with PCOS

Table-Ia: Reproductive and cutaneous features among Bangladeshi women with PCOS

No.	Authors	Year	PCOS	Irregular cycles	Hirsutism	PCOM	Acne	AN	Abortion	Subfertility
01.	Begum	2009	78	100.0	91.7	—	—	—	—	—
02.	Nahar et al.	2017	100	95	69	96	31	8.0	—	50.0
03.	Pervin et al.	2020	150	66.0	58.0	—	16.0	—	—	51.2
04.	Begum et al.	2021	55	94.5	69.1	81.8	50.9	—	14.5	21.8
05.	Hoque et al.	2021	50	100.0	22	—	—	—	—	—
06.	Akhter et al.	2022	35	77.1	54.3	—	25.7	—	—	—
07.	Chowdhury et al.	2022	100	25	—	16	—	—	—	—
08.	Nigger et al.	2023	55	55	—	—	—	—	—	—
09.	Sumona et al.	2023	100	97	57	73	6	54	—	95
10.	Afrine et al.	2023	100	90	60	89	48	71	6	14
11.	Kamrul-Hasan & Aalpona	2023	840	92.1	—	80.5	—	—	—	—
12.	Jahan et al.	2023	40	87.5	97.5	80	57.5	70.0	17.5	25
13.	Jahan et al.	2023	90	—	—	—	—	—	—	61.1
14.	Kharel et al.	2023	55	90.9	87.3	89.1	60	58.2	—	—
15.	Aalpona et al.	2023	150	—	84	—	—	—	—	—
16.	Morshed et al.	2023	160	87.4	—	—	30.4	—	—	13.3
17.	Hima et al.	2023	120	40	67.5	—	28.3	—	—	18.3
18.	Chowdhury et al.	2023	80	91.9	73.0	57.0	—	—	—	77.5
19.	Shefin et al.	2024	237	86.9	41.8	—	—	—	—	—
20.	Morshed et al.	2024	100	91	84	89	29	36	—	89
21.	Nayeem et al.	2024	158	88	84.2	84.2	—	—	—	—
22.	Hossan et al.	2024	44	—	—	70.5	—	—	—	—
23.	Ferdous et al.	2024	50	72	30	—	58	—	—	42
24.	Akhter et al.	2025	80	80	17	—	—	—	—	—
25.	Jahan et al.	2025	108	94.4	91.7	92.6	37	37	—	14.8
26.	Hossain et al.	2025	75	81.3	76	66.7	—	—	—	—
27.	Khatun et al.	2025	600	48	32	—	74	—	—	—
28.	Chowdhury et al.	2025	40	90	47.5	80	57.5	70	26.9	38.5
29.	Haseen et al.	2025	266	—	90.6		57.9	—	—	18.8
30.	Poly et al.	2025	140	80	60.7	79.3	40.7	—	—	—
31.	Rashid et al.	2025	40	100	72.5	70	80	57.5	5	60

Data were expressed in %
Polycystic ovarian morphology (PCOM), Acanthosis nigricans (AN)

Table-Ib: Reproductive and cutaneous features among women with PCOS and subfertility

Sl.	Authors	Year	PCOS	Irregular cycles	Hirsutism	PCOM	Acne	AN	Abortion
01.	Anwary et al.	2009	50	80.0	50.0	100.0	52.0	—	10.0
02.	Khatun et al.	2017	30	46.7	—	50.0	—	—	—
03	Mahdi et al.	2018	324	78.4	95.0	—	—	—	3.7
04.	Khanam & Zaman	2023	100	88	24	74	42	34	—
05.	Choudhury et al.	2024	80	73.8	13.8	—	—	—	—
06	Sarker et al.	2024	73	—	26	—	—	—	—

Data were expressed in %
Polycystic ovarian morphology (PCOM), Acanthosis nigricans (AN)

and up to 71% may present with AN.

e. Subfertility and abortion:

Up to 95% women may present with subfertility, and 27% may present with abortion.

D. Phenotype of PCOS:

Phenotype A was the most common, with a reported range of 43% to 73%. The prevalence of other phenotypes was inconsistent (Figure-4).

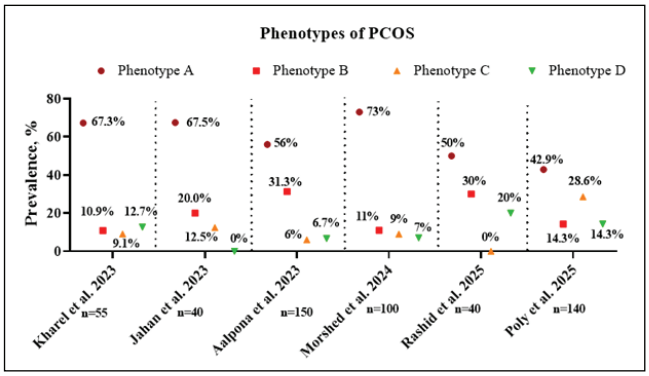


Figure-4: Recent studies reporting the prevalence of phenotypes of PCOS

E. Polycystic ovarian morphology by ultrasonography:

Among 100 women with prolonged subfertility (>10 years), USG detected 16 women with PCOM (Tanzeem et al. 2022). The prevalence of PCOM among 100 women with subfertility was 42% (Rahman et al. 2019). Sharma et al. (2025) found a prevalence of PCOM among 12.5% of suspected women with PCOS.

Among 55 women with PCOM, the percentage of hirsutism, irregular cycles, subfertility, hyperandrogenemia, and altered LH/FSH ratio was present in 36.4%, 63.6%, 56.3%, 58%, and 58.2%, respectively (Nahar et al. 2014).

Among 83 women with PCOS, those with PCOM (n=54) had a higher frequency of irregular cycles (71.5% vs. 21.2%) and LH/FSH ratio levels, but a similar frequency of hirsutism (58.5% vs. 55.7%) and obesity (25.3% vs. 27.9%), and similar levels of prolactin, testosterone, and DHEAS as those without PCOM (Islam et al. 2019).

F. Laparoscopic findings in PCOS:

Laparoscopy showed a prevalence of 8% PCOM among 50 women with subfertility (Ahmed et al. 2022). Tanzeem et al. (2022) found a prevalence of PCOM in 34 women out of 100 women with prolonged subfertility.

Among 73 subfertile women with PCOS, uterine size was abnormal in nearly 8% of cases, and fallopian tubes were not patent in 20-25% of cases (Anwary et al. 2011). Another study by Deeba et al. (2013) found that nearly 5.5% of women had endometriosis in both ovaries, and about 18.4% had blockage in at least one fallopian tube.

G. Clinically detectable metabolic features in women with PCOS (Table-IIa):

Overweight and obesity are very common among women with PCOS. Most studies define obesity with a BMI cut-off of 25 kg/m² and report a prevalence of up to 92%, excluding articles that only included cases of obesity. Both waist circumference and waist/hip ratio were used to define central obesity. The highest reported prevalence was 79.3%. Rahman (2024) found that women with PCOS (n=50) had higher BMI and waist/hip ratio than women without PCOS (n=50). Non-lean (n=112) subfertile women with PCOS (≥23 kg/m^2) had higher percentages of hyperandrogenemia, insulin resistance, and metabolic syndrome than the lean women (BMI <23 kg/m^2, n=14) with PCOS (Ishrat & Hossain, 2021).

Hypertension is less frequently reported. Elevated blood pressure was present in up to 38%, and hypertension in 6% of women with PCOS.

H. Laboratory-related metabolic features among women with PCOS (Table-IIb):

a. ***Dysglycemia:***

Abnormal glycemic status may be found in up to 64% of women with PCOS. The highest reported prevalence of diabetes mellitus was alarmingly high (26%).

Although fasting and 2H-OGTT were higher in the IGT than the NGT group, only the 2H-insulin/glucose ratio was higher in the T2DM than the NGT group. Both IGT and T2DM had lower HOMA-%S than the NGT group (Laila et al. 2014).

b. Dyslipidemia:

Dyslipidemia was also a universal feature of PCOS (up to 97%). Elevated triglycerides (≥150 mg/dL) and LDL-cholesterol (>130 mg/dL) were also very common in PCOS (up to 84% and 94%, respectively).

Despite similar BMI, women with PCOS (n=40) had higher fasting glucose, total cholesterol, and triglycerides, but lower HDL cholesterol than healthy controls (n=40) (Begum et al. 2022).

c. Metabolic syndrome:

Nearly 25% to 53% of women with PCOS may suffer from metabolic syndrome.

d. Insulin resistance:

i.Prevalence: Different HOMA-IR cut-offs were used to

Table-IIa: Clinically detectable metabolic profile of Bangladeshi women with PCOS

No.	Authors	Year	PCOS	Control	Obesity	Central obesity	Elevated BP/ HTN
01.	Begum	2009	78	33	67 vs. 19.0	64.0 vs. 29.0	—
03.	Nahar et al.	2017	100	—	52	52.0	—
04.	Jahan et al.	2018	50	50	74.0 vs. 24.0	—	—
05.	Mahdi et al.	2018	324	—	65.4	—	—
06.	Selim & Lona	2019	4138 adolescent	—	21.2	—	—
07.	Pervin et al.	2020	150	—	58.0	—	—
08.	Begum et al.	2021	55	50	50.9	60.0	12.7
09.	Hoque et al.	2021	50	—	54	22.0	—
10.	Hassan et al.	2022	153	60	—	—	—
11.	Khanam & Zaman	2023	100 subfertile	—	92	—	—
12.	Afrine et al.	2023	100	—	73	21.0	—
13.	Jahan et al.	2023	40	—	75	—	—
14.	Kharel et al.	2023	55	—	52.7	—	—
15.	Hima et al.	2023	120	—	32.5	26.7	22.6
16.	Chowdhury et al.	2023	86	86	58.1 vs. 29.1	—	—
17.	Nur-E-Nazma	2023	95 adolescent	—	25.3	—	—
18.	Kamrul-Hasan & Aalpona	2023	840	—	78.5	79.3	38.2
19.	Akhter & Siddika	2024	107	—	39.4	76.6	23.4
20.	Imran et al.	2024	94	—	3.0	—	—
21.	Hossan et al.	2024	44	44	75.0	—	—
22.	Nayeem et al.	2024	158	126	40.0 vs. 32.0	—	—
23.	Shefin et al.	2024	237	—	42.0	—	—
24.	Choudhury et al.	2024	80	—	12.5	—	—
25.	Sarker et al.	2024	73	73	31.5.0 vs. 37.0	—	—
26.	Ferdous et al.	2024	50	—	100.0	—	6.0
27.	Jahan et al.	2025	108	—	47.2.0	44.4	—
28.	Chowdhury et al.	2025	40	38	75.0	60.0	—
29.	Rashid et al.	2025	40	40	52.5 vs. 30.0	—	—
30.	Ghosh et al.	2025	100	—	75.0	72.0	—
31.	Hossain et al.	2025	75	—	90.7	—	—
32.	Mustari et al.	2025b	160	—	61.9	—	—
33.	Poly et al.	2025	140	—	35.7	—	—
34.	Ahmed et al.	2025	66	—	69.7	—	—

Data were expressed in %, HTN (Hypertension), Elevated BP (SBP 130 &/or DBP ≥85 mm-Hg)

define IR. The highest prevalence, 81%, was reported by Afrine et al. (2023).

ii. Association with obesity: Women with PCOS with insulin resistance had a higher frequency of obesity and central obesity (Hoque et al. 2021). PCOS women with obesity (n=99) had higher 2H-OGTT glucose and IR than those without obesity (n=61) (Mustari et al. 2025). Poly et al. (2025) found higher testosterone but lower SHBG and LH/FSH ratio in PCOS women with obesity (n=50) than without obesity (n=90).

iii. Association of irregular cycles: Ishrat & Hossain (2020) found a significant association between fasting insulin and insulin resistance with oligomenorrhea and amenorrhea among 125 women with PCOS.

iv. Association with hyperandrogenism: A study conducted among 60 women with PCOS and 20 controls did not find a significant correlation between hyperandrogenemia and hyperinsulinemia (Banu et al. 2015).

Table-IIb: Laboratory-detected metabolic features among women with PCOS

No.	Authors	Year	PCOS	Control	Dysglycemia	Dyslipidemia	Metabolic syndrome	Insulin resistance	MASLD
01.	Begum	2009	78	33	IGT: 30.0	—	—	42.0 vs. 12.0	—
02.	Anwary et al.	2009	50	—	AGS: 30	—	—	—	—
03.	Nahar et al.	2017	100	—	—	↑TC: 84.0 vs. 10.0 ↑TG: 84.0 vs. 18.0 ↑LDL-C: 94.0 vs. 16.0 ↑TG/HDL-C: 68.0 vs. 16.0	—	42.0	—
04.	Selim & Lona	2019	4138 adolescent	—	PDM:18.7 DM: 7.9	—	—	32.4	—
05.	Hoque et al.	2021	50	—	—	—	—	60.0	—
06.	Hassan et al.	2022	153	60	—	—	44.4 vs. 36.7		23.5 vs. 3.3
07.	Khanam & Zaman	2023	100 subfertile	—	IGT-34.0 DM-26.0	↑ TC: 40	—	—	—
08.	Afrine et al.	2023	100	—	AGS: 64.0	—	51.0	81.0	—
09.	Jahan et al.	2023	40	—	AGS-60.0	—	45.0	50.0	—
10.	Kharel et al.	2023	55	—	—	—	27.3	69.1	—
11.	Hima et al.	2023	120	—	PDM: 45, DM: 16.7	DL: 96.7	26.7		26.7
12.	Chowdhury et al.	2023	86	86	—	—	—	—	—
13.	Nur-E-Nazma	2023	95 adolescent	—	IFG- 46.7	—	—	35.0	—
14.	Kamrul-Hasan & Aalpona	2023	840	—	AGS- 31.0	DL-88.6	53.0	—	—
15.	Akhter & Siddika	2024	107	—	PDM-21.1	DL- 90.9	42.3	—	—
16.	Hossan et al.	2024	44	44	DM- 2.9	—	22.7	40.9	—
17.	Nayeem et al.	2024	158	126	AGS- 27.3	—	—	52.0 vs. 28.0	—
18.	Shefin et al.	2024	237	—	—	—	—	—	81.0
19.	Ferdous et al.	2024	50	—	—	—	—	—	—
20.	Jahan et al.	2025	108	—	DM- 2.0	↑TC-13, ↑TG-25.9, ↑	—	—	—
21.					—	LDL-2.8, ↓HDL-C- 44.4			
22.	Chowdhury et al.	2025	40	38	—	—	27.5	50.0	—
23.	Rashid et al.	2025	40	40	AGS- 20.0 vs.15.0	—	25.0 vs. 20.0	57.5 vs. 20.0	—
24.	Ghosh et al.	2025	100	—	—	—	—	—	—
25.	Hossain et al.	2025	75	—	—	—	—	60.0	—
26.	Poly et al.	2025	140	—	—	—	—	—	—
	Ahmed et al.	2025	66	—	—	—	—	45.5	—

Impaired glucose tolerance (IGT); Abnormal glycemic status (AGS); Prediabetes mellitus (PDM); Diabetes mellitus (DM); Impaired fasting glucose (IFG); Total cholesterol (TC); Triglyceride (TG); Dyslipidemia (DL); Metabolic dysfunction-associated steatotic liver disease (MASLD)

v. Insulin resistance and thyroid function: Hossain et al. (2025) found that the frequency of higher TSH (>2.5 mIU/mL) was higher among PCOS women with insulin resistance (n=45) than those with insulin sensitivity (n=30).

vi. Insulin resistance and ferritin: Among 99 subfertile women with PCOS, 47 had high ferritin (≥45.5 ng/mL). Those with high ferritin had a higher frequency of insulin resistance (HOMA-IR>2.8: 78.3% vs. 21.7%) (Begum et al. 2021).

vii. Insulin resistance and ovarian volume: In women with PCOS and PCOM, ovarian volume correlated more closely with metabolic features (IR and metabolic syndrome) than follicle number per ovary (Afrine et al. 2023). PCOS women with ovarian volume ≥10 cc (n=34) had a higher frequency of IR (HOMA-IR>3.7) than those with OV <10 cc (n=32) (Ahmed et al. 2025).

viii. Insulin and serum calcium and magnesium: Among 100 women with PCOS, a negative association was found between fasting insulin levels and calcium and magnesium status (Ghosh et al. 2025). About 60% had a neck circumference of at least 34 cm.

e. Metabolic dysfunction-associated steatotic liver disease (MASLD):

Shefin et al. (2024) reported 81% prevalence of MASLD in women with PCOS. The presence of clinical hyperandrogenism is a protective factor for MASLD, as found in a study by Hima et al. (2023).

i. Adiposity indices:

All adiposity indices (BMI, WC, visceral adiposity index, lipid accumulation product, triglyceride-glucose index, etc.) showed an androgen-independent association with IR in women with PCOS. However, none of them were useful markers of IR (AUC<0.8) (Morshed et al. 2025). Triglyceride/HDL-cholesterol ratio and triglyceride-glucose index positively correlated with HOMA-IR in women with PCOS (n=160) (Mustari et al. 2025b).

J. Adipokines:

Jahan et al. (2023) found no association between serum adiponectin levels and PCOS or its manifestations.

K. Hormones in PCOS (Figure-5):

Rahman (2024) found that women with PCOS (n=50) had higher TSH, LH/FSH ratio, and prolactin than women without PCOS (n=50).

i. Hyperandrogenemia: Depending on various cut-offs of total testosterone and free androgen index, up to 75% women with PCOS may have hyperandrogenemia (Figure-5a).

ii. Hyperprolactinemia: Nearly 10%-30% women with PCOS may have mildly elevated hyperprolactinemia. Khanam and Zaman (2023) reported a 74% prevalence of elevated prolactin. Prolactin had an age and BMI-adjusted inverse association with fasting plasma glucose and a positive correlation with TSH among women with PCOS (Kamrul-Hasan & Aalpona, 2023) (Figure-5b).

iii. Thyroid dysfunctions: The highest prevalence of primary hypothyroidism, subclinical hypothyroidism, and hyperthyroidism was 16%, 21%, and 8%, respectively. Others described thyroid dysfunction based on lower TSH cut-offs (Figure-5c).

iv. Thyroid autoantibodies: Akhter et al. (2021) conducted a study among 80 women with PCOS and 20 healthy controls with euthyroid status. Both AntiTPOAb (32.5% vs. 10.0%) and Anti-TgAb (37.5% vs. 10.0%) were positive at a higher frequency in the PCOS group than in the control group. Both androgenic and metabolic features were more common in those with thyroid abnormality (n=21) than in those with euthyroid status (n=79) (Sumona et al. 2023).

v. Hypothyroidism and ALT: Among 50 women with PCOS and obesity, SCH (38%), overt hypothyroidism (14%), and raised ALT (>40 U/L) 36%. Hypothyroidism was a predictor (OR=2.6) of raised ALT (Ferdous et al. 2025c).

vi. Altered LH/FSH ratio: Up to 93% of women with PCOS may have an altered LH/FSH ratio with a cut-off of 2:1 (Figure-5d).

vii. Antimulleran hormone (AMH): Khatun et al (2017) found 64% prevalence of high AMH in 30 women with PCOS. Banu et al. (2022) showed that measuring AMH was inferior to USG for PCOM in diagnosing PCOS. Morshed et al. (2023) showed that adding AMH criteria to ultrasonographic criteria almost eliminated phenotype B and made the other phenotypes more similar with respect to metabolic features. Metabolic and hormone profiles were across the quintiles of serum AMH among 150 women with PCOS. AMH weakly correlated with total testosterone, and phenotype A had the highest AMH levels (Aalpona et al. 2023). Morshed et al. (2024) showed that AMH negatively correlated with testosterone and was a poor marker of PCOS. Only phenotype A had higher AMH than controls.

L. Inflammation in PCOS:

Women with PCOS had higher levels and status of high-sensitivity CRP than controls (Begum et al. 2021). Rashid et al. (2025) found similar levels of hsCRP and afamin between PCOS and controls. Serum afamin level

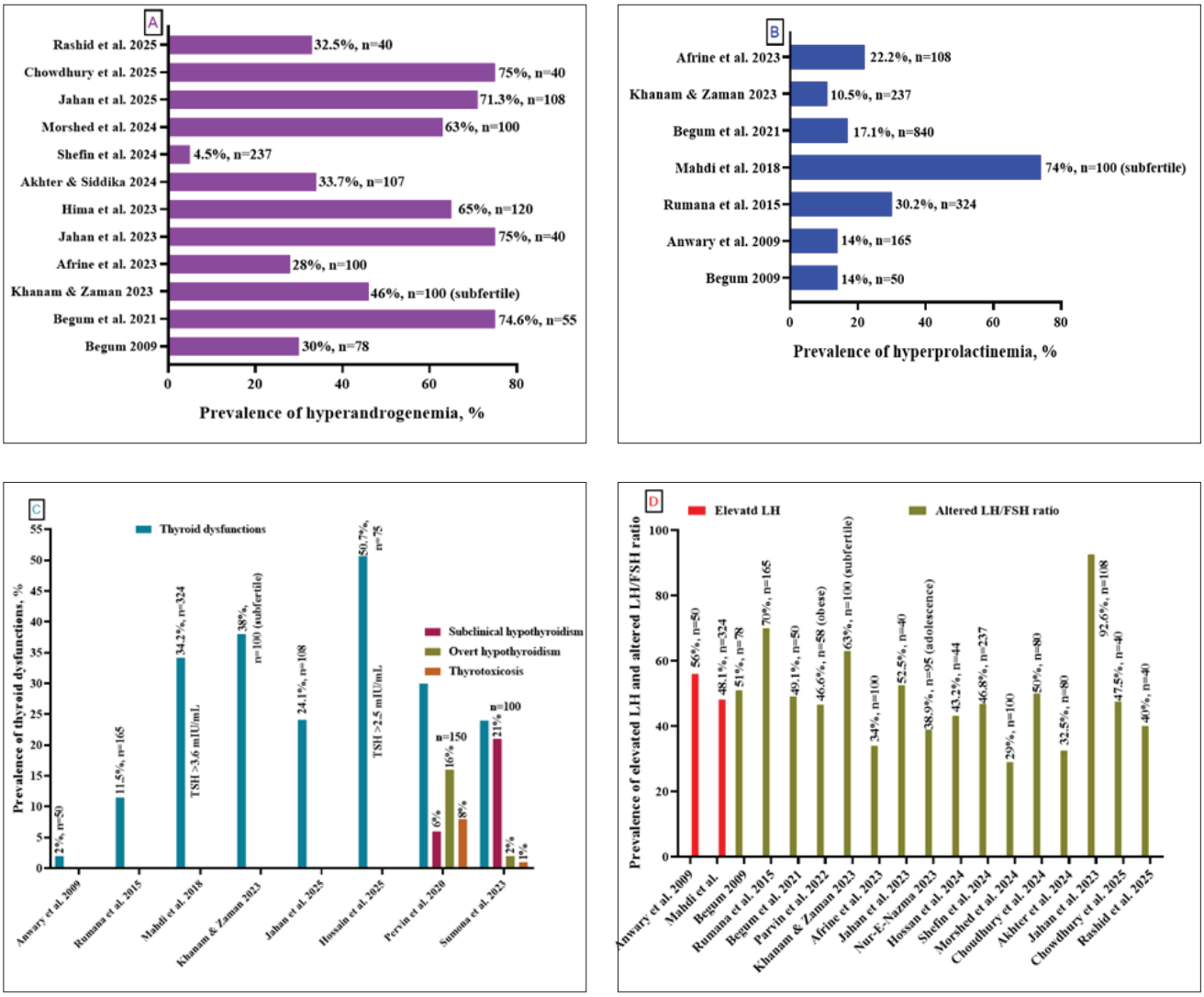


Figure-5: Hormone abnormalities among women with PCOS, A) hyperandrogenemia, B) hyperprolactinemia, C) thyroid dysfunctions, D) altered LH/FSH ratio

was higher in PCOS than in controls, only for those having metabolic syndrome. Begum et al. (2023) found a higher hsCRP/albumin ratio in women with PCOS (n=40) than in non-PCOS (n=40).

M. Micronutrients in PCOS:

Kamrul-Hasan & Aalpona (2022) showed that metformin-treated women with PCOS (n=52) for at least 6 months developed lower hemoglobin levels and a higher frequency of vitamin B12 deficiency (15.4% vs. 6%) than treatment-naïve women with PCOS (n=50). Among 94 women with adolescent PCOS, 95.7% had vitamin D deficiency (<20 ng/mL), and 4.3% had vitamin D insufficiency (20-30 ng/mL). Vitamin D was no associated with BMI categories (Imran et al., 2024).

N. Miscellaneous:

i. Prolidase: Prolidase is a cytosolic enzyme that degrades the extracellular matrix in the ovary. Akhter et al. (2022) found higher levels of prolidase in women with PCOS (n=35) than in healthy controls (n=35), and a good marker of PCOS (AUC=0.87).

ii. Kisspeptin: Both Jahan et al. (2023) and Kharel et al. (2023) did not find an association between serum kisspeptin levels and PCOS. However, Jahan et al. (2023) found positive correlations among kisspeptin with ovarian volume, serum LH, and AMH in women with PCOS.

iii. D-dimer: Hossan et al. (2024) did not find a significant association between serum D-dimer levels and PCOS or its manifestations.

iv. Bisphenol A: Women with PCOS had higher serum

bisphenol A levels, especially those with a history of subfertility and abortions (Chowdhury et al. 2025).

v. Genetic study: A study conducted among 93 women with PCOS and 79 controls showed that rs10818854 and rs10986105 in the DENND1A gene: the G allele of rs10986105, rather than T, was associated with twice the odds of PCOS (Haidar et al. 2024).

O. Family history:

Up to 86% of women with PCOS may have a positive family history of PCOS in 1st degree relatives. Khatun et al. (2025) found that a positive family history of PCOS increases the risk of PCOS by five times. Metabolic disorders and subfertility are also prevalent in 1st degree relatives of women with PCOS (Table-III).

P. Lifestyle and PCOS:

Dietary habits, such as eating fast food, rich foods, rice, and soft drinks more frequently, and consuming fewer vegetables and fruits, are more common among women with PCOS (n=100) than among healthy controls (n=100) (Khondker & Nabila, 2022). Among 100 subfertile women with PCOS, 68 followed a healthy diet, 54 ate fast food, and 32 exercised (Khanam & Zaman, 2023). Although physical activity levels were similar, women with PCOS spent more time sitting than women without PCOS (Chowdhury et al. 2023). Jannat et al. (2024) found that women with PCOS (n=60) had higher rates of physical inactivity and lower regular tea intake compared to the control group (n=60). Ferdous et al. (2024) reported that among 50 women with PCOS, 92% led sedentary lifestyles, 36% ate fast food more than twice a week, and 42% slept less than 50 hours a day. Selim and Lona (2019) observed that 61.4% of 4138 adolescents with PCOS had a sedentary lifestyle.

Q. Mental health in PCOS:

A mixed-method approach among 413 women found a prevalence of PCOS of 17.4%. Among them, nearly 80% had anxiety and depression, and 78% felt distress. Nearly 64% had poor knowledge regarding their condition (Muna et al. 2024). Jannat et al. (2024) showed that the frequency of bad family relationships was higher (63.3% vs. 30%) in those with PCOS than in controls. Among 266 women with PCOS, 32% had moderate depression, 68% had extremely severe anxiety, and 45% had severe stress. Menstrual problems and insomnia were risk factors for both anxiety and stress. Additionally, marriage and subfertility were risk factors for anxiety (Haseen et al. 2025).

R. Knowledge and experience of patients on PCOS:

A qualitative research conducted among 25 women with PCOS showed unsatisfactory experience, negative perception, and stigmatization (Wasata et al. 2020).

S. Approach to management of PCOS by physicians:

Mustari et al. (2025) surveyed 643 physicians (86% of whom were Gynecologists) regarding their management practices for PCOS. More than one-third preferred the Rotterdam criteria for diagnosis and treatment for PCOS. Irregular cycles (81.5%) and subfertility (69.2%) were the two most common presenting symptoms. Lifestyle modification (80.1%) and metformin (72.5%) were the two most prescribed treatment options.

Table-III: Family history of PCOS and other comorbidities among women with PCOS

Sl.	Authors	Year	Number		Family history					
			PCOS	Control	Irregular cycles	PCOS	Subfertility	DM	HTN	Obesity
01.	Selim & Lona	2019	4138	—	—	—	—	45.6	—	—
02.	Jannatul et al.	2024	60	60	73.3 vs. 46.7	26.7 vs. 6.7	26.7 vs. 6.7	66.7 vs. 30	—	—
03.	Shefin et al.	2024	237	—		75.9			76.9	—
04.	Ferdous et al.	2024	50	—	10	18	92	42	—	—
05.	Akhter et al.	2025		—	—	86	—	—	—	—
06.	Chowdhury et al.	2025	40	38	—	20 vs. 0	—	67.5 vs. 52.6	—	65 vs. 32.5
07.	Rashid et al.	2025	40	40	—	22.5 vs. 0	—	35 vs. 12.5	52.5 vs. 32.5	37.5 vs. 15
08.	Poly et al.	2025	140	—	—	22.9	—	—	—	—

Data were expressed in %

Polycystic ovary syndrome (PCOS); Diabetes mellitus (DM); Hypertension (HTN)

T. Pregnancy outcome:

A study conducted among 50 women with PCOS and 50 women with control showed a higher incidence (26% vs. 10%) of gestational diabetes mellitus (GDM) development in the PCOS group than in the non-PCOS group. Statistical analysis was not shown (Begum et al. 2017). A prospective study was conducted in a private tertiary care hospital for two years, starting from June 2020, among 55 women with PCOS and 55 women with control. The frequencies of preeclampsia (9.1% vs. 0.0%), low-birth-weight (<2.5 kg) babies (35.8% vs. 18.2%), and Neonatal ICU admissions (39.6% vs. 20.0%) were higher in the PCOS group than in the control group. The frequencies of gestational diabetes mellitus, gestational hypertension, preterm baby, caesarean section, and still birth were similar between the study groups (Nigger et al. 2023).

U. Interventional studies (Supplementary File-2):

a. Metformin:

Metformin only: A 2012 study among 50 women found that metformin (850 mg/twice daily or 500 mg/thrice daily), combined with lifestyle modifications over one year, improved clinical manifestations of PCOS, including menstrual cycle regularity (90%), weight loss (44% lost 2 kg), and reduced testosterone levels. Along with clomiphene citrate (CC) and/or letrozole, nearly 66% ovulated, and 10% became pregnant (Anwary et al. 2012).

One hundred women with PCOS were treated with a 500 mg tds dose of metformin for 4 months. Improvements occurred in fasting insulin (MD -10.5 μIU/mL), area under the curve of insulin (MD -125.3), LH (MD -5.6 mIU/mL), LH/FSH ratio (MD -0.9), and free testosterone (MD -1.4 pg/mL). The study by Johra et al. (2023) took place at a secondary-care hospital in 2022.

Metformin vs. Placebo: A double-blind, placebo-controlled randomized controlled trial included 80 PCOS participants aged 18-35 years, conducted in a University hospital. They received either metformin (500 mg tds, n=26 completed) or placebo (n=23 completed) for nine months along with lifestyle management. Per protocol analysis showed mean serum AMH increased in both groups (2.6 ng/mL and 5.6 ng/mL). Serum TT was reduced (2.2 ng/mL), and progesterone (3.6 ng/mL) was increased in the metformin but not in the placebo group. Changes between the groups were not compared (Nazma-Akhtar et al. 2016). In another publication from the same study group, the metformin group showed greater improvements in BMI (MD = -5.1%) and WC (MD = -4.5%) than the placebo group (Nazma-Akhtar et al., 2021).

An RCT was conducted by Nabi et al. (2020) in a private medical college hospital between November 2016 and March 2018. Participants were randomly allocated to either metformin (500 mg tds) plus lifestyle (n=40) or lifestyle alone (n=40) for 12 months. Per-protocol analysis showed a superiority of the combination therapy (n=33) over lifestyle alone (n=32) in respect to mean difference in menstrual regulation (+8), weight (-2.7 kg), BMI (-3.5 kg/m^2), total testosterone (-1.6 ng/mL), and triglyceride (-35.0 mg/dL) levels, but not in mFG score, WC, LH, FSH, or their ratio and other lipid fractions.

Metformin vs. Oral combined contraceptive:

In 2019, an RCT was done in a University hospital among women with PCOS (age: 18-35 years, BMI: 18-25 kg/m^2), subfertility, high AMH (>5 ng/mL), and resistant to three cycles of CC. Patients were treated with either cyproterone acetate (CPA, 2 mg/day) and 0.35 mg/day ethinyl estradiol (EE) or metformin (dose not specified) for 6 months. While serum LH and OGTT glucose levels were reduced in both groups, serum AMH level was decreased (MD=-5.2 ng/mL) only in the CPA+EE group (Banu et al. 2020).

Metformin vs. Myoinositol:

An open-label randomized trial was done in a secondary-level hospital in 2022 between two groups receiving either myoinositol (1.0 g bd, n=50) or metformin (0.5 mg bd, n=50) over 16 weeks among women with PCOS. Among the different clinical and laboratory features, the myoinositol group showed a greater reduction in free androgen index and HOMA-IR, as well as fewer side effects than the metformin group (Johra et al. 2023).

Metformin for the prevention of gestational diabetes mellitus:

An RCT conducted in a private tertiary-level infertility care center between 2002 and 2006 among 59 nondiabetic clomiphene citrate (CC) resistance PCOS women. Twenty-nine patients continued taking metformin (1.5–2.5 g based on BMI categories) throughout pregnancy, while a control group of 30 patients discontinued it. GDM developed in only 3.44% of the metformin group, compared with 30% in the control group. The control group also had four large-for-date babies, while the metformin group had none. The authors concluded that metformin is safe and effective in

preventing GDM (Begum et al., 2009).

b. Inositols:

Myoinositol: A single-arm quasi-experimental study was done in 2018 among 35 women with PCOS and subfertility in a government hospital by Yasmin et al. (2019). All were treated with 2 g of myoinositol bd with 0.2 mg folic acid bd for 6 months. Among them, 80% restored spontaneous menstruation, and 28.5% obtained a singleton pregnancy with one spontaneous abortion.

Myoinositol+metformin vs. Metformin: Women with PCOS, insulin resistance, primary subfertility, and letrozole with dexamethasone induced ovulation failure were randomly treated by either metformin (1.5-2.5 g divided dose, n=80) or metformin with myoinositol (MI, 2 g daily), and 0.2 mg folic acid (n=80) for 12 weeks. Then MI was omitted, and metformin was continued. Following OI, the frequency of both ovulation (77.5% vs. 43%) and pregnancy (43.8% vs. 25.0%) was higher in the combination group than in the metformin-only group (Begum et al. 2020).

A quasi-experimental study was conducted among insulin-resistant (HOMA-IR >1.8), subfertile women with PCOS (age: 18–40 years, BMI <30 kg/m^2, FSH <10 mIU/mL) at a University hospital between July 2020 and June 2021. Before ovulation induction with letrozole, one group was treated with myoinositol (MI: 1 gm bd) with metformin (500 mg tds), and another group was treated with only metformin. After 12 weeks, only metformin was continued. The letrozole-treated group (n=26) had a higher frequency of mature follicles (≥18 mm: 60.9% vs. 28.0%) and an ovulation rate (mid-luteal progesterone >3 ng/mL: 73.9% vs. 44.0%), but a similar frequency of adequate ET (≥7 mm) and pregnancy rate as the metformin group (n=26) (Rani et al. 2022).

D-chiroinositol vs. Placebo: A 12-week course of D-chiro inositol 500 mg od (n=26) improved serum LH (MD=-2.4 mIU/mL), LH/FSH ratio (MD=-0.3), total testosterone (MD=-0.4 nmol/L), fasting insulin (MD=-2.7 μIU/mL), and HOMA-IR (MD=-0.7) than placebo (n=27) in women with PCOS (age: 18-40 years, BMI: 23-30 kg/m^2, and HOMA-IR >1.7). No significant differences were observed in serum FSH, fasting blood glucose, and side effects. This study was conducted at a University hospital between July 2021 and December 2022 by Akhter et al. (2023).

c. Obesity medications:

Acarbose vs. Orlistat: An open-label RCT was conducted at a University hospital among 18-to 40-year-old women with PCOS and obesity (BMI ≥ 30 kg/m^2) from July 2019 to June 2020. One group was treated with acarbose 100 mg tds (n=16) and another group with orlistat 120 mg tds. After 3 months, the frequency of at least 10% weight loss (37% vs. 25%) and side effects (81.2% vs. 14.3%) was higher in the orlistat group than in the acarbose group. However, menstrual cycles were regularized more (37.5% vs. 18.8%) in the acarbose group than in the orlistat group (Afrin et al. 2021).

Liraglutide ± Metformin: An open-label RCT conducted in a University hospital from January 2018 to August 2019 among women with PCOS and obesity (BMI ≥27.5 kg/m^2). Along with lifestyle therapy, one group (n=14) was treated with sc liraglutide 1.2 g daily with metformin (1 g daily), and another group with metformin only (n=10). After 12 weeks, Percentage changes in weight (-3.0%), BMI (-3.2%), and HOMA-IR (-20.0%) were greater in the liraglutide group than in the metformin group (Hossain et al. 2024).

Tirzepatide: A retrospective study was conducted in several tertiary care private hospitals from June 2024 to February 2025 among 56 women with PCOS with obesity (BMI ≥27 kg/m^2). Participants were treated with 7.5 mg weekly tirzepatide along with lifestyle therapy. The maximum tolerated dose, drop-out rate, and treatment duration were not described. After the end of therapy, both PCOS-related features (irregular cycles: -53.6%, acne: -34%, ovarian cysts: -48.3%) and metabolic profiles (weight: -8.1 kg, BMI: -4.0%, fasting glucose: -1.3 mmol/L, HbA1C: -0.8%, insulin resistance: -30.4%, sleep apnea: -25.0%), and psychiatric symptoms (depression/anxiety: -32.1%, fatigue: -19.6%) significantly improved. The most common side effects were heartburn (42.9%), nausea/vomiting (39.3%), and general weakness (33.9%) (Ferdous et al. 2025).

d. Ovulation induction:

i. Letrozole:

Letrozole only: Siddiqui et al. (2010) conducted a quasi-experimental study in a tertiary care level infertility center among 60 CC-resistant, anovulatory PCOS women who were treated with 5.0 to 7.5 mg of letrozole orally. Patients served as their own historical controls. Letrozole administration resulted in a statistically significant increase in both follicular size (MD=7.4 mm) and endometrial thickness (MD=3.5 mm). Ovulation was successfully induced in 63.3% of patients, with the majority responding to the higher 7.5 mg dose (26/38) and developing multiple follicles (26/38).

Ovulation induction by a 7.5 mg/day dose of letrozole produced similar follicular recruitment (PCOS vs. control: 75% vs. 60%), maturation (≥18 mm: 50% vs. 47.5%), and endometrial thickness (≥8 mm: 62.5% vs.

52.5%) in subfertile women irrespective of PCOS status. This study was conducted in 2011 in a private tertiary care center among 56 women with subfertility (age: 20 - 40 years), including 16 women with PCOS (Mahtab et al. 2019).

Low-dose extended vs. Double-dose short letrozole protocol: An RCT was conducted in a University hospital between July 2020 and June 2021 among 18-35-year-old PCOS women with subfertility. One group was treated with a low-dose extended letrozole (2.5 mg/day for 10 days from D2) protocol, and another with a double-dose short letrozole (5 mg/day for 5 days from D2) protocol. The mean number of growing follicles was higher in the low-dose extended letrozole protocol than in the double-dose short letrozole protocol (MD=0.5) (Jahan et al. 2022).

Letrozole vs. Clomiphene citrate (Table-IV): All of the studies showed superiority of leterozole over clomiphene citrate in different outcomes of ovulation induction, such as improved endometrial thickness, higher ovulation and monofollicular development, pregnancy rate, but lower multifollicular development and abortion rate. However, follicular response, endometrial pattern, morphological grading, and vascular zone were similar between the study groups (Mahmuda et al. 2022). But, time to pregnancy (MD -2.5 weeks) was lower in those treated with letrozole than in the CC group (Hasnat et al. 2023).

Letrozole vs. Gonadotropin: Mile et al. (2023) conducted an RCT among subfertile women with PCOS. For ovulation induction, women were treated with either letrozole 2.5 mg bd (n=53) or im 75 U/day of gonadotropin (n=53) for five days, starting from D3 for five cycles. Endometrial thickness (MD 0.8 mm) as well as ovulation rate (86.7% vs. 62.2%), pregnancy rate (64.1% vs. 30.1%), and live birth rate (54.7% vs. 26.4%) were also higher in the letrozole than in the gonadotropin group.

Letrozole ± Glucocorticoid An experimental study conducted at both government and private settings investigated the addition of a glucocorticoid (dexamethasone 0.5 mg/day, every other day from D2-D10) to letrozole treatment for 280 infertile patients with PCOS who failed to ovulate on letrozole (10 mg/day) alone. The study found that 65% of patients ovulated and 33.21% achieved pregnancy, concluding that the addition of a glucocorticoid significantly improves folliculogenesis, ovulation, and pregnancy rates (Begum et al., 2012).

Letrozole ± coenzyme Q10

An open-label, parallel-group RCT was conducted at a University hospital between February 2021 and January 2022 among subfertile women with PCOS (age: 18-35 years, BMI: 18-30 kg/m^2) by Nasrin et al. (2022). Addition of coenzyme Q10 (100 mg bd, n=40) with letrozole (5 mg/day for 5 days from D2) achieved a higher frequency of mature follicles in the 2nd and 3rd cycles; adequate ET and ovulation in all three cycles; and a cumulative pregnancy rate than in the letrozole alone (n=40).

Letrozole ± Estradiol valerate

An RCT conducted by Jesmin et al (2024) among subfertile women with PCOS from July 2021 to June 2022 at a tertiary care hospital. One group was treated by letrozole 5.0-10.0 mg/day from D3-D7, followed by

Table-IV: Letrozole vs. Clomiphene citrate as an ovulation induction drug

Sl.	Authors	Year	Population	Intervention	No.	ET, mm	Follicular development		Ovulation	Pregnancy	Multiple pregnancy	Abortion
							Single	Multiple				
01.	Begum	2009	CC-resistant	Let 7.5 mg/d	32	10.4	—	—	62.5	40.6	—	—
	et al.			CC 150 mg/d	32	9.0	—	—	37.5	18.8	—	—
02.	Zeba	2018	Subfertile	Let 2.5 mg bd	120	9.2	69	30	65	44	—	—
	et al.			CC 50 mg bd	120	8.1	56	44	64	24	—	—
03.	Begum	2020	Subfertile	Let 2.5 mg/d	80	—	66.3	2.7	62.5	46.3	2.7	2.7
	et al.			CC 100 mg/d	80	—	43.7	23.8	58.8	26.3	23.8	19.0
04.	Mahmuda	2022	Subfertile	Let 5-7.5 mg/d	21	8.9	—	—	—	—	—	—
	et al.			CC 100-150 mg/d	15	7.4	—	—	—	—	—	—
05.	Hasnat	2023	Subfertile	Let 2.5-7.5 mg/d	51	9.4	72.6	—	84.3	47.1	—	—
	et al.			CC 50-150 mg /d	51	9.2	51.0	—	51.0	23.5	—	—

Endometrial thickness (ET), except for ET (mm), data was expressed in %

estradiol valerate 4.0 mg/day from D9-D12 (n=33). Another group received only letrozole (n=32). After five cycles, those treated with estradiol valerate achived higher (MD 2.3 mm) ET than those treated with letrozole only (Jesmin et al. 2024).

Effect of letrozole on liver function test based on fatty liver disease: A study was conducted in a government tertiary care hospital between October 2023 and March 2024 among 150 subfertile women with PCOS who were treated with letrozole for ovulation induction. Their liver function test (LFT) after the treatment was compared between those with or without fatty liver disease (FLD). Serum ALT (MD: 13.5 U/L), AST (MD: 18.6 U/L), ALP (MD: 15.5 U/L), and bilirubin (MD: 0.6 mg/dL) were all significantly higher in those with FLD than in those without the condition. The baseline LFTs were not mentioned (Sarkar et al. 2025).

Association between sociodemographic factors and letrozole's efficacy: A study was conducted among 116 women with PCOS and subfertility in a tertiary-level hospital between April 2022 and September 2023. Participants were divided based on their response to letrozole 5 mg/day for ovulation induction. There were no significant associations between any sociodemographic factors and response to ovulation induction (dominant follicle ≥16 mm). Only serum FSH level was higher in the nonresponder group than in the responder group (Sultana et al. 2025).

Prevention of ovarian hyperstimulation syndrome (OHSS):

The comparative study, conducted between October 2008 and June 2013, in a private infertility center, Dhaka, included 120 high-risk patients (76.7% had PCOS) for developing OHSS, splitting them into a letrozole group and a coasting group (withholding gonadotropins). The results suggest that letrozole is similarly effective in reducing estrogen levels, leading to a similar incidence and severity of OHSS compared to coasting, without negatively impacting pregnancy rates (Begum et al. 2014).

ii. Clomiphene citrate (CC):

Metformin vs. clomiphene citrate: A randomized controlled trial conducted by Begum et al. (2014) at a government institute found no statistically significant difference between metformin (n=35) and clomiphene citrate, CC (n=36) in cumulative ovulation rates (57.1% vs. 61.1%) or pregnancy rates (34.3% vs. 42.9%) over six months (2012), concluding that metformin (500 mg tds) is as effective as clomiphene citrate (100 mg/day for D2-D6) for inducing ovulation and pregnancy in women with PCOS.

Clomiphene citrate ± Metformin: The study by Begum & Begum (2005) investigated using metformin with clomiphene citrate (CC) for PCOS patients resistant to CC, finding that the combination significantly improved ovulation rates compared to CC alone, with a notable 60% ovulation in the CC+Metformin group (n=30) versus 25% in the CC-only group (n=36), suggesting it's a beneficial adjunctive therapy for CC-resistant infertility.

AMH levels influencing CC's efficacy:

A study conducted in a University hospital showed that those with AMH levels ≥8 ng/mL (n=11) had smaller follicular size than those with <8 ng/mL (n=35) after induction with CC 100 mg/day for 5 days (Munira et al. 2021).

iii. Metformin+CC vs. Metformin+rFSH vs. rFSH

A randomized controlled trial involving 165 infertile, clomiphene citrate (CC)-resistant PCOS patients in both tertiary-level government and private hospitals, compared metformin combined with CC, metformin combined with recombinant follicle-stimulating hormone (rFSH), and rFSH alone. The group receiving metformin plus rFSH showed the highest ovulation (89.09%) and pregnancy (54.55%) rates, while the metformin plus CC group had the lowest (27.27% ovulation, 12.73% pregnancy). The study concluded that metformin enhances the response of ovulation-inducing agents and is safe for use in PCOS (Begum et al., 2013).

iv. Estradiol valerate vs. Placebo:

Yasmin et al. (2023) conducted a randomized controlled trial during the year 2022, at a University hospital among subfertile women with PCOS who did not achieve an ET of at least 7 mm at day 8 of letrozole induction (age: 18-40 years, BMI: 18-30 kg/m^2). One group was treated with estradiol valerate 4 mg/day, and another group received a placebo from D8 for 5 days. The mean changes of ET on the day of triggering were higher (MD = 0.7 mm) in the estradiol valerate group than in the placebo group. Pregnancy rate was similar between the study groups.

v. Standard ovulation induction ± Multiple micronutrients:

A randomized controlled trial compared the effect of adjuvant multiple micronutrients (MMN, including vitamin C, E, inositols, and L-arginine) with standard ovulation induction (n=50) versus standard induction alone (n=50) among 20-40 years aged subfertile women with PCOS conducted in a University and a private hospital between July 2011 and June 2012. After three

Table-V: Laparoscopic ovarian drilling as a treatment for subfertility among women with PCOS

Sl.	Authors	Year	Population	Intervention	No.	Menstruation regularization	ET	Ovulation	Conception	Pregnancy	Abortion	Others
01.	Banu et al.	2021	CC-resistant	LOD with 6 m follow-up	60	60	70	—	—	50	—	—
02.	Nargis et al.	2022	Subfertile	LOD followed by OI for 6 cycles	45	88.9	—	—	—	15.6	—	—
03.	Begum et al.	2023	Subfertile	LOD	50	—	—	65	—	—	—	—
				OI by drugs	100	—	—	72	—	—	—	—
05.	Borna et al.	2024	Subfertile	LOD with 6 m follow-up	244	—	—	68.4	—	55.3	—	Improve IR & BMI
06.	Choudhury et al.	2024	Subfertile	25-50 mg/day CC for 6 cycles	25	—	—	60	24	—	8	—
				2.5-10 mg/d letrozole for 6 cycles	25	—	—	68	24	—	4	—
				LOD with 6 m follow-up	30	—	—	76.7	60	—	6.7	—

Laparoscopic ovarian drilling (LOD); Ovulation induction (OI); Endometrial thickness (ET); Insulin resistance (IR); Body mass index (BMI)
Data were expressed in %

cycles, the MMN group achieved higher endometrial thickness (>9 mm) (73.8% vs. 46.9%) and clinical pregnancy rate (44% vs. 12%). There was no significant difference in first-trimester miscarriage rates (2 in each group) or progesterone levels between the groups (Banu et al., 2013).

vi. Melatonin:

A randomized open-label trial was conducted in a University hospital among subfertile women with PCOS (age: 18-35 years, BMI ≤30 kg/m^2). Forty participants received melatonin 3 mg at night for 8 weeks, then underwent ovulation induction with letrozole for three cycles while continuing melatonin. The control group was treated with only ovulation induction with letrozole (n=34). Pretreatment with melatonin improved glycemic status (65% vs. 25%), total testosterone (MD -13.5 ng/dL), LH (MD -2.8 mIU/mL), and HOMA-IR (MD -1.1). The number of mature follicles obtained per cycle (MD 0.9), dominant follicle size (MD 2.5 mm), endometrial thickness (MD 0.6 mm), and midluteal progesterone (MD 8.7 pg/mL) were higher in the melatonin-letrozole group compared to the letrozole only group. The ovulation rate (80.3% vs. 59.5%) and pregnancy rate (45.0% vs. 20.6%) were also higher in the melatonin group than in the placebo group (Akter et al. 2023).

vii. Ovarian drilling:

Laparoscopic ovarian drilling (LOD) is a viable alternative to ovulation-inducing drugs, especially in cases of resistance (Table V).

Research gap and future direction:

Research on PCOS in Bangladesh has reached a critical point. Although the number of publications has increased, the quality and depth of the research often do not meet international standards. Most studies are small in sample size, single-center, tertiary-level cross-sectional studies. There are no population-based prevalence studies or follow-up research. Areas like genetics, epigenetics, gut microbiota, and omics have not yet been explored. Additionally, there is a lack of interdisciplinary collaboration within the country and with international partners. Many studies are published in predatory journals or in journals that lack major indexing. Support from institutions and international mentorship is needed to improve publication quality. Future goals include developing a centralized database, establishing biobanking, and conducting interventional trials in collaboration with the global community.

Conclusions

Studies on PCOS in Bangladesh have increased in recent years, focusing on baseline characteristics and

interventional studies. These studies are limited by small sample sizes, single-center design, and publication in grey journals, leading to limited visibility and impact.

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Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author upon reasonable request.

Ethical Approval and Consent to Participate
Nil.

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