

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20240770>

Original Research Article

Maternal and perinatal outcomes in women with polycystic ovarian syndrome

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Received: 05 February 2024

Accepted: 02 March 2024

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ABSTRACT

Background: Pregnant individuals with polycystic ovarian syndrome (PCOS) seem to face a heightened susceptibility to unfavorable outcomes. This investigation aimed to evaluate the consequences of pregnancies in patients diagnosed with PCOS.

Methods: This cross-sectional study involving 115 pregnant patients with PCOS was carried out at the department of obstetrics and gynecology, Dhaka medical college and hospital, Dhaka, Bangladesh, tertiary care facility, from January 2023 to December 2023. Data on the ongoing pregnancy, PCOS, and outcomes were analyzed by SPSS version 20.

Results: Average age of participants was 25.07 years. Incidence of premature rupture of membranes (PROM) was 33.91%, low APGAR score at 5 minutes was 12.17%, gestational diabetes (GDM) occurred in 23.47% of cases, miscarriage was reported in 2.1%, preterm delivery in 13.91%, cesarean delivery in 37.39%, low birth weight babies accounted for 2.6%, macrosomia occurred in 0.7%, preterm PROM (PPROM) in 19.52%, perinatal mortality 1.73%.

Conclusions: In pregnancy with PCOS, the percentage of GDM, preterm delivery, meconium-stained liquor, small for gestational age (SGA)/intrauterine growth restriction (IUGR), macrosomia, PPRM, perinatal mortality, neonatal intensive care unit (NICU) admission, and congenital anomalies were either comparable or lower. However, a higher percentage of hypertension in pregnancy, PROM, low birth weight babies, and low APGAR score at five minutes was observed in this population.

Keywords: PCOS, Pregnancy complications, Hypertension, Perinatal outcome

INTRODUCTION

The prevalence of PCOS, a common and intricate female endocrine disorder, is estimated to range from 3% to 20%, depending on the diagnostic criteria utilized. Clinical signs of PCOS encompass menstrual irregularities (oligomenorrhea or amenorrhea), hirsutism, chronic acne, androgen-dependent alopecia, abdominal obesity, hypertension, and infertility.¹ A significant proportion, ranging from sixty to eighty percent, of individuals are obese. Obesity has a detrimental cumulative impact on various aspects of PCOS, including insulin resistance,

hyperandrogenism, infertility, hirsutism, and complications during pregnancy.² Furthermore, the combination of insulin resistance and obesity in individuals with PCOS poses an increased risk of developing DM2, metabolic syndrome (MS), cardiovascular diseases (CVD), miscarriage, and complications during late pregnancy such as preeclampsia and GDM. This underscores that PCOS is chronic condition that can impact women across various age groups.³ In recent times, these patients face a heightened likelihood of encountering pregnancy-related challenges. This suggests that PCOS is not solely associated with

metabolic disorders, irregular menstruation, or infertility, as previously reported. There is a growing recognition that negative pregnancy outcomes, including GDM, preeclampsia, premature delivery, neonatal birth weight issues, elevated rates of cesarean sections, are all linked to PCOS during pregnancy.⁴⁻⁶ The heightened risk of adverse consequences exhibited significant variability, depending on the specific characteristics and phenotypes associated with the condition.⁷ Additionally, one study suggests that these patients have an elevated risk of congenital abnormalities.⁸ Nevertheless, conflicting evidence exists, as some investigations have failed to confirm the higher risk of congenital abnormalities in this context.⁹⁻¹⁷ As a result, the outcome in this condition is unknown with certainty.

METHODS

This cross-sectional study involving 115 pregnant patients with PCOS was carried out at the department of obstetrics and gynecology, Dhaka medical college and hospital, Dhaka, Bangladesh, a tertiary care facility, from January 2023 to December 2023. Ethical committee gave its approval to study protocol. A thorough interview schedule including sociodemographic information, menstrual, marital, obstetric, previous, personal, and family history was obtained after they gave their informed consent. A thorough medical history was taken, including the period of PCOS diagnosis, and criteria taken into consideration (e.g., oligomenorrhea, ultrasound results, and testosterone levels in PCOS-affected women). It was noted how patient had treated PCOS and history of infertility. Measurements taken during the physical examination were blood pressure, BMI, height, and weight. Up to birth, pregnancy was checked monthly. Records were kept on the mode of delivery, perinatal outcome, and maternal problems. MS excel was used to enter the data, while SPSS version 20 was used for data analysis. Age, weight, and gestational age were examples of continuous variables. Parity and a variety of outcomes were categorical variables under investigation. Results were presented as proportions.

Inclusion criteria

Pregnant women with a diagnosis of PCOS and patients who gave consent to participate in the study were included.

Exclusion criteria

Patients who did not give consent and patients with other obstetric complications were excluded.

RESULTS

Average age of women was 25.07 years. Mean height, mean weight, and mean BMI were recorded as 145 cm, 67.59 kg, and 27.75 kg/m², respectively. Notably, 66% of the study subjects were classified as overweight, and 18% were categorized as obese. Significant portion, 53%, reported a history of infrequent menstruation, while 44%

exhibited polycystic ovaries according to ultrasound findings (Table 1).

Table 1: Characteristics of the patients, (n=115).

Patient characteristics	N	Percentages (%)
Age (average years± SD)	25.07±3.2	
Mean height (cm)	145	
Mean weight (kg)	67.59	
Mean BMI (kg/m²)	27.75	
First-degree family history of DM	15	13.0
First-degree family history of CVD	61	53.0
Gravidity		
0	80	69.5
1	25	21.7
2	7	6.0
3 or more	3	2.6
Parity		
0	89	77.3
1	19	16.5
2	4	3.0
3 or more	3	2.6
Positive history of smoking or alcohol consumption	0	0.0

Table 2: Maternal outcome among the study subjects, (n=115).

Characteristics	N	Percentages (%)
Maternal outcomes		
Hypertension		
Gestational hypertension	21	18.26
Pre-eclampsia	7	6.08
Diabetes		
GDMA1	12	10.43
GDMA2	15	13.04
Obstetric		
Abortion	6	5.21
IUGR/SGA	3	2.61
Rupture of membranes		
PPROM	19	19.52
PROM	39	33.91
Preterm labor	16	13.91
Delivery		
Period of gestation		
Preterm	17	14.78
Term	96	83.47
Post-term	2	1.74
Nature of labor		
Induced	54	46.95
Spontaneous	46	40.00
Mode of delivery		
SVD	72	62.60
Cesarean section	43	37.39

In this series, abortion occurred in 6 (5.21%) patients, and IUGR/SGA in 3 (2.61%) patients, 39 (33.91%) patients experienced PROM, 19 (19.52%) had PPROM (Table 2).

Table 3: Perinatal outcome in the study subjects, (n=115).

Status of newborn	N	Percentages (%)
Alive	110	95.65
Stillbirth	3	2.60
Neonatal death	2	1.73
Birth weight of newborn (gm)		
<1000	3	2.60
1001-1499	7	6.08
1500-1999	11	9.56
2000-2499	19	16.52
2500-2999	35	30.43
3000-3499	27	23.47
3500-3999	12	10.43
>4000	1	0.869
APGAR score		
0/0	1	0.869
<8/9	14	12.17
≥8/9	96	83.47
NICU admission	25	21.74
Congenital anomaly	2	1.739
Meconium-stained liquor	9	7.8

Most of the babies (95.65%), were born well and alive. Unfortunately, three babies (2.6%) were stillborn, with one case involving a mother with GDM and hypertension. Additionally, two babies passed away on postnatal day 5, both experiencing respiratory distress and low birth weight. Among the 115 delivered fetuses. One fetus had cystic hygroma, leading to the termination of the pregnancy at 19 weeks (Table 3).

DISCUSSION

In this series, women's ages ranged from 20 to 44 years, with a mean age of 25.07. Similar to previous research, the percentage of pregnant women aged 35 and above was 4.1%.^{8,10,13,14,16,17} In this series, the respondents exhibited an average BMI of 27.75 kg/m². In comparison, a retrospective cohort study reported that overweight subjects had a high mean BMI of 30.8 kg/m², surpassing the BMI of women with normal weight.¹⁰ In our study, 66% of the participants were classified as overweight, and 18% were categorized as obese. These figures differ from those reported in another population-based study, where the frequency of obesity was notably higher at 61%.¹⁴ In our study, 6.2% of the study subjects exhibited acanthosis nigricans, and among these individuals, 78.5% had concurrent diagnoses of hypothyroidism. Notably, the presence of Acanthosis nigricans is not reported in any other research studies currently available in the literature. In this study, the percentage of primigravida was 83.1%, a figure that stands out as notably higher than the prevalence

reported in other investigations, which typically ranged from 47% to 81%.^{10,14,16} In our study, approximately 46% of women conceived naturally, while 54% conceived after receiving treatment with ovulation-inducing medications or assisted reproductive technologies. Interestingly, this differs from findings in other studies where the use of assisted reproductive technologies (ART) along with ovulation-inducing medications increased the pregnancy rate to 71.4% and decreased the rate of spontaneous conception to 29%.¹⁶ Consistent with our results, another Australian study that included a 2,566 study population revealed that 8% of them had successfully conceived by in vitro fertilization (IVF).⁸ In our investigation, 10% of the respondents had multiple fetal pregnancies. This finding aligns with a study conducted in Finland involving 99 women with PCOS, suggesting a comparable prevalence of multiple fetal pregnancies in both studies.¹⁹ However, it is significantly higher than the 3.3% found in an Australian study.⁸ Consistent with prior research, our study identified percentages of 6.08% for preeclampsia and 18.26% for hypertension. These figures align with findings reported in previous studies. However, a lower 2.4% to 11% incidence of hypertension and a greater 8-12% preeclampsia percentage have also been shown.^{8-10,17} In our study, 13% of the subjects revealed a diagnosis of GDM. This rate is consistent with findings from another Indian case-control study that encompassed 56 women with PCOS, indicating a comparable prevalence of GDM in both studies.¹⁶ However, other research has indicated a lesser rate of GDM fluctuating from 7.2% to 8%.^{8,10,18} As of now, meta-analyses have consistently reported a two- to three-fold increased incidence of GDM among these populations.¹¹⁻¹⁵ In our analysis, the percentage of SGA or IUGR newborns among women affected by PCOS was 3% higher compared to findings from another retrospective study conducted in India. This variation emphasizes the potential for differences in outcomes across studies and populations.¹² Compared to other studies that documented a higher rate of SGA or IUGR newborns, fluctuating from 8% to 13%, our study observed a lower percentage. Some studies have reported a 1.5-2-fold higher risk of SGA/IUGR in pregnancies affected by PCOS compared to typical pregnancies. This discrepancy underscores the variability in reported rates across different research studies.^{13,15,20} In our study, 19.52% of women experienced membrane rupture during preterm gestation, and 33.9% during term gestation. While the prevalence of preterm rupture of membranes was comparable to findings from a meta-analysis, the occurrence of rupture at term was significantly higher than that reported in another Indian retrospective investigation involving 110 PCOS patients, where the incidence was 8%.¹³ This discrepancy highlights the variability in reported rates across different studies.¹⁷ The frequency of preterm delivery in this series, at 14.78%, is higher compared to the findings of a prospective Indian study involving 56 women with PCOS, indicating variability in preterm delivery rates across different research studies.¹⁸ In our analysis, 62.6% of women had assisted vaginal delivery, while 37.39% underwent a cesarean section. The incidence of cesarean

sections in this series was lower compared to previous research, which reported a higher prevalence ranging from 39% to 64%. This discrepancy underscores the variations in delivery modes across different studies.^{7,8,17,18} Of the 27 studies that included 4982 PCOS women, one meta-analysis showed no discernible change in risk.¹² The frequency of low birth weight, very low birth weight, and extremely low birth weight babies was 2.6%, 6.08%, and 26.08% in this series, respectively, although it was lower (4.9-11.4%) in two previous investigations.^{8,10} It was found that, the subjects exposed percentages of GDM, preterm delivery, meconium-stained liquor, SGA/IUGR, PPRM, perinatal mortality, NICU admission that were either similar or lower compared to those reported in the healthy pregnant women. However, the percentages of hypertension in pregnancy, PROM, low birth weight babies, and low APGAR score at five minutes were higher in this study's population. This suggests distinctive patterns of pregnancy-related consequences in subjects with PCOS compared to healthy pregnant women.²¹

CONCLUSION

The results of this study provide additional insights into the outcomes associated with PCOS. While certain findings confirm existing knowledge, others contradict the perceived risks associated with pregnancy and PCOS. It is crucial to emphasize the need for more extensive cohort studies with extended follow-up periods to comprehensively explore the correlation between PCOS and the various potential adverse consequences for both mothers and fetuses during pregnancy. This would contribute to a better understanding of the complexities involved in pregnancies among women with PCOS.

Funding: No funding sources

Conflict of interest: None declared

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

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Cite this article as: Hoque LF, Zinan AZ, Apsara S, Danny AS. Maternal and perinatal outcomes in women with polycystic ovarian syndrome. *Int J Reprod Contracept Obstet Gynecol* 2024;13:812-6.