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Original Research Article

Risk of Adverse Pregnancy Outcome in Women with Polycystic Ovarian Syndrome (PCOS) at JLNMCH, Bhagalpur, Bihar

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Abstract

Background: There is some evidence that pregnant women with polycystic ovarian syndrome are more likely to experience poor maternal and perinatal outcomes. There are few data from India analysing the success of pregnancies in women with polycystic ovarian syndrome. To assess the success of pregnancies in women with polycystic ovarian syndrome, this study was proposed.

Methods: From May 2021 to October 2022, this descriptive study on 135 pregnant women with polycystic ovarian syndrome at the JLNMCH in Bhagalpur, Bihar. Using SPSS version 20, data on the current pregnancy, polycystic ovarian syndrome, and maternal/perinatal outcomes were analysed. Parity and various maternal and perinatal outcomes were evaluated as categorical factors.

Results: With a mean age of 26.8 years, a high BMI of 77%, and a history of primary infertility in 88% of cases, With a mean age of 26.8 years, a high BMI of 77%, and a history of primary infertility in 88% of cases, Pregnant women who had hypertensive disorders were more likely to have PROM (18.5%), low APGAR scores at 5 minutes (13%) and gestational diabetes (13%) than those who did not. They were also more likely to experience miscarriage (2.2%), preterm birth (10.4%), caesarean delivery (30.4%), low birth weight babies (2%), macrosomia (0.7%), PPROM (8%), perinatal mortality (2%) and NICU admission (20%).

Conclusion: However, the proportion of GDM, miscarriage, preterm delivery, meconium stained liquor, caesarean delivery, small for gestational age/IUGR, macrosomia, PPROM, perinatal mortality, NICU admission, and congenital anomalies was found to be either similar or lower in pregnant women with PCOS in our study compared to those described in the general pregnant population.

Keywords: PCOS, Pregnancy outcome, Maternal outcome, Perinatal outcome

Introduction

The most prevalent endocrine condition affecting women of reproductive age is polycystic ovarian syndrome (PCOS). According to estimates, 6 to 15% of women

have this condition [1]. It can be identified by any two of the three criteria listed below: polycystic ovarian characteristics on ultrasonography, hyperandrogenism, and irregular menstruation with oligo-anovulation [2]. PCOS-positive pregnant women appear to be more likely to experience poor maternal and neonatal outcomes [1-13]. Negative maternal outcomes include a high likelihood of miscarriage, a higher probability of developing gestational diabetes mellitus, a higher possibility of developing hypertensive disorders of pregnancy, and a tendency toward premature birth and surgical delivery.

Small perinatal hazards, like as macrosomia, meconium aspiration syndrome, low APGAR scores at 5 minutes, NICU hospitalisation, and perinatal mortality, are mentioned in the literature. Despite the fact that this has not been demonstrated in other investigations, one study has found that pregnant women with PCOS have a higher likelihood of having congenital abnormalities [4] But when compared to women without PCOS, other studies have also found either no difference or a decreased incidence of particular outcomes [3-13]. As a result, there is no solid evidence detailing how these pregnancies turned out.Indian data evaluating the pregnancy outcome in women with polycystic ovary syndrome are sparse [11-13] and are of small sample size. Thus, this study was proposed to evaluate the pregnancy outcomes in women with PCOS.

Material and Methods

From May 2021 to October 2022, this descriptive study was conducted in the Obstetrics & Gynecology Department of the Jawaharlal Nehru Medical College and Hospital in Bhagalpur, Bihar. women who have received a PCOS diagnosis based on Rotterdam's standards. A thorough interview schedule encompassing socio-demographic information, menstrual/marital/obstetric/past/personal/family history was gathered after gaining their informed consent. A thorough history of PCOS was recorded, along with the date of the diagnosis of polycystic ovarian syndrome, factors taken into consideration, such as oligomenorrhea, ultrasound results, and testosterone levels in PCOS-affected women. A history of infertility and PCOS treatment was kept. Height, weight, BMI, blood pressure, acanthosis nigricans, and hirsutism were all noticed during the physical examination. Up until delivery, the pregnancy was followed up on every month.

MS Excel was used to enter the data, while SPSS version 20 was used for analysis. Age, weight, and gestational age were examples of continuous variables that were reported as mean ±SD when suitable.

Parity and other maternal and perinatal outcomes were evaluated as categorical variables, and results were reported as proportions.

Results

There were 135 PCOS-pregnant women in all who gave birth at JLNMCH and took part in our study. In our survey, women were 26.83 years old on average. In our survey, the proportion of pregnant women above the age of 65 was 3.7%; teenage pregnancies were absent. Most (52%) had completed high school, 29% had finished upper secondary, and 19% had earned a degree. According to modified Prasad's classification, the bulk of the 135 participants (67%) belonged to the low class, 28% to the middle class, and 5% to the high class. The average person was 155 cm tall, weighed 66.69 kg, and had a BMI of 27.15 kg/m^2. Sixty-three percent (63%) of the study population were over-weight in our study, and 15% were obese. The proportion of Acanthosis nigricans was found to be 5.2% among study population.

On ultrasonography, 42% of women had polycystic ovaries, and 53% of women reported a history of irregular menstrual periods. According to Rotterdam's criteria for the diagnosis of PCOS, 11% of patients possessed characteristics of clinical and/or biochemical evidence of hyperandrogenism. Nearly 94% of the women had received PCOS treatment before getting pregnant. Nine women (7%) underwent ovarian drilling, and 57 (42%) of the women had conceived while taking metformin.

Primary infertility affected 88% of the women, while secondary infertility affected 12% of the primigravida. Nearly 62% of women had pregnancies spontaneously, whereas 38% had pregnancies via ovulation induction therapy or intrauterine insemination/in vitro fertilisation. In our study, 9.0% of pregnancies were twins, 0.7% were triplets, and 90.3% were singleton pregnancies.

Table 1 provides an overview of the maternal outcome of these pregnancies. Pre-eclampsia affected 4% of women, while gestational hypertension affected 14% of women. Thirteen percent (13%) of women were found to have gestational diabetes mellitus, of which 7% required metformin/insulin and 6% were on a diabetic diet.

One occurred in the second trimester and the other in the first, both of which were spontaneous miscarriages. Due to a cystic hygroma, one patient underwent an induced abortion at 19 weeks into the second trimester.

Table 1: Maternal outcome in study population

Characteristic	Frequency (n)	Percentage (%)
Maternal outcome		
Hypertension		
• Gestational hypertension	19	14.1%
• Pre-eclampsia	5	3.7%
Diabetes		
• GDMA1	8	5.9%
• GDMA2	10	7.4%
Obstetric		
• Abortion	3	2.2%
• IUGR/SGA	3	2.2%
Rupture of membranes		
• PPROM	11	8.1%
• PROM	25	18.5%
• Preterm Labour	14	10.4%
Period of gestation		
• Preterm	14	10.4%
• Term	119	88.1%
• Post-term	2	1.5%
Nature of labour		
• Induced	68	50.5%
• Spontaneous	58	6.6%
Mode of delivery		
• SVD	80	59.2%

• Instrumental delivery	14	10.4%
• Caesarean section	41	30.4%

Rupture of the membranes was reported by about 27% of the participants, of which 19% occurred at term gestation and 8% occurred preterm.

Table 2: Perinatal outcome

Status of newborn		
• Alive	146	97.8%
• Still birth	2	1.5%
• Neonatal death	1	0.7%
Birth weight of newborn (grams)		
• <1000	4	2.7%
• 1001-1499	9	6.0%
• 1500-1999	14	9.4%
• 2000-2499	27	18.1%
• 2500-2999	46	30.9%
• 3000-3499	38	25.5%
• 3500-3999	10	6.7%
• >4000	1	0.7%
Characteristic	**Frequency (n)**	**Percentage (%)**
APGAR score		
• 0/0	2	1.3%
• <8/9	19	12.8%
• ≥8/9	128	85.9%
Meconium stained liquor	11	7.4%
NICU admission	29	19.5%
Congenital anomaly	2	1.3%

10% of the women experienced premature labour. Small for gestational age babies were delivered by 2.2% of mothers who gave birth on schedule.

At the time of delivery, 10% of women were preterm and 2% were postterm. 50% of the women had their labours induced, 43% experienced spontaneous labour, and 7% underwent LSCS on their own volition. The majority of the ladies (59%) gave birth vaginally on their own. 30% of deliveries by caesarean section and 10% by assisted birth respectively.

Table 2 displays the perinatal outcomes of women who had PCOS during pregnancy. The vast majority of the infants (97%) were born alive and healthy. One of the two percent (2%) stillborn babies was born to a mother who also had gestational diabetes and hypertension.

On the fifth postnatal day, one infant passed away from respiratory distress and low birth weight. The majority of newborns had weights between 1,000 and 2,999 grams (31%), 2,500 and 2,999 grams (26%), 3,000 and 3,499 grams (26%), and less than 3,500 grames (7.4%). The majority of the infants (86%) had an APGAR score of 8 or lower at birth. Due to respiratory distress, 13 percent (13%) received low APGAR scores. 7.4% of the study group had alcohol with meconium

stains, however there were no meconium aspiration cases. For one of two reasons—low birth weight or respiratory distress—nearly 20% of the infants were admitted to the NICU. 15 (10.06%) of the neonates admitted to the NICU needed bag and mask ventilation, and 3 needed intubation. Two (1.3%) of the 149 delivered foetuses were found to have abnormalities.

At 19 weeks, the pregnancy was ended due to a cystic hygroma in one of the foetuses. The second of the twins, who was born at 37 weeks of gestation via spontaneous vaginal birth, had hypoplasia of the lungs, which was discovered postnatally, and required ventilator support. Despite medical advice, the baby was taken home.

Discussion

Numerous studies have examined the chances of conception in women with PCOS, but the results are mixed. The age distribution of the women in our study ranged from 21 to 44 years, with a mean age of 26.8 years. According to previous research [4-12]. there were no teenage pregnancies, and the percentage of pregnant women who were above the age of 35 was 3.7%. Similar to another study [9] the majority of the PCOS-positive pregnant women in our study (52%) had completed high school, 29% had completed higher secondary, and 19% had earned a degree.

In our study group, pregnant women with PCOS had a mean BMI of 27.15 kg/m^2. Another retrospective cohort study found that overweight women with PCOS had a higher mean BMI of 30.8 kg/m^2 than normal weight women [5] In our study, 63% of the population was overweight, and 15% of them were obese, which is less than in another community-based study where the prevalence of obesity was 61% [9] In their findings, a small retrospective Indian research of 110 PCOS-pregnant women found a reduced proportion of overweight women (58%) [12].

In our study, 5.2% of women with PCOS had Acanthosis nigricans, while 80.5% of the women had hypothyroidism identified. Other studies make no reference to acanthosis. In our analysis, the prevalence of primigravida was 88.1%, which is much higher than the prevalence reported in other studies [5-11]. which ranged from 47 to 81%. In our study, over 62% of the women gave birth on their own, whereas 38% did so following treatment with either ovulation-inducing medications or assisted reproductive technologies. This is in contrast to other studies that found a greater pregnancy rate of 71.4% with usage of OI and ART [13] and a reduced rate of spontaneous conception of 29% [11]. In another Australian study in 2,566 PCOS women the proportion of women who had conceived after in vitro fertilization was 8% similar to our study [4].

In our study, 10% of PCOS pregnant women had multiple pregnancies, which is comparable to a study conducted in Finland on 99 PCOS pregnant women [14] But when compared to an Australian study, it is substantially greater (3.3%) [4] In our study of pregnant women with PCOS, the prevalence of hypertension and preeclampsia was reported to be 14.1% and 3.7%, respectively, which is comparable to other studies [3-13]. However, a larger percentage of preeclampsia of 8–12% has also been shown [4,5] as well as a lower incidence of hypertension ranging from 2.4% to 11% [5-12] Five metaanalyses on the success of pregnancies in PCOS-positive women have reported a two- to four-fold increase in hypertension/preeclampsia [6-10].

In our study, 13% of PCOS-positive pregnant women were diagnosed with GDM, which is comparable to another Indian case-control study on 56 PCOS-positive women [11] Other investigations, however, have

discovered a lower rate of GDM, ranging from 7.2% to 8% [4-13]. In contrast, according to two other studies [3-12]. pregnant women with PCOS had a greater incidence of GDM, which was 22%. Up to this point, metaanalyses [6-10] have shown a two- to threefold increased incidence of GDM in pregnant women with PCOS. In our study, the rate of miscarriage in pregnant women with PCOS was 2.2%, which is lower than the incidence reported in earlier studies, which ranged from 8.1% to 20% [4-13].

In our analysis, the percentage of SGA/IUGR births among PCOS-positive women was 2%, which was comparable to another retrospective study from India [12] In other research, the incidence of SGA/IUGR newborns was greater, ranging from 8% to 13% [3,4] therefore this is lower. Some studies [6-9] have shown that the risk of SGA/IUGR is the same in both cases.

According to several research [8-15]. when compared to typical pregnant women, there is a 1.5–2-fold increase in risk. In our study, there were 8% and 18.5% of women who experienced membrane rupture at either a preterm or term gestation, respectively. While a metaanalysis [8] compared the rate of preterm rupture of membranes to that of another Indian retrospective study on 110 PCOS women, the incidence of membrane rupture at term was significantly greater [12].

In our study, the preterm birth rate was 10.4%, which is comparable to an Indian prospective study on 56 PCOS women [13]. When compared to other studies, which reported a higher incidence ranging from 13.9 to 19.2% [3-12]. this is significantly less. According to many metaanalyses [6-10]. pregnant women with PCOS have a 1.3–3.9-fold higher risk of premature delivery. In our study, there were 30.4% of caesarean deliveries and 10.4% of assisted vaginal deliveries, respectively.

Compared to other studies that revealed a higher prevalence of caesarean sections, our study's incidence of caesarean sections was lower [3-12]. In one metaanalysis of 27 trials comprising 4982 PCOS women, no difference in risk was shown [7]. Other metaanalyses, however, have revealed a 1.2–1.9fold elevated risk [8-10].

In our study, the percentage of macrosomia was 0.7%. Studies conducted thus far have reported a greater frequency of macrosomia in PCOS pregnant women, ranging from 6 to 18% [3-12] According to metaanalyses [8-10]. women with PCOS had a 1.2–1.5 fold increased risk of having macrosomic offspring. Another prospective trial on 56 PCOS women conducted in India indicated that the women receiving metformin medication did not give birth to any macrosomia babies [13] In our study, the incidence of low birth weight, very low birth weight, and severe low birth weight infants was 27.4%, 6%, and 2.7%, but it was lower (4.9-11.4%) in two earlier studies [4,5].

In our study, 13% of babies born to pregnant mothers with PCOS had an APGAR score of <8/9 at 5 minutes, which is greater than the 4.2% incidence identified in another Australian study [4] However, a population-based cohort study of 3787 PCOS women indicated a 1.4fold greater likelihood of having poor APGAR [9] Our study observed a 7.4% incidence of meconium-stained liquid, which is slightly higher than the incidences reported in prior studies [3-12] which ranged from 3.2 to 3.6%. However, there is a 1.2–2.3 fold greater risk of having meconium-tainted alcohol after delivery, per two metaanalyses [8,9].

97% of the infants in our study were born alive and in good health. A study from Australia and another retrospective investigation both found that 2% of babies were stillborn [3,4] In our study, 20% of infants born to pregnant women with PCOS

were admitted to the NICU. In certain investigations [3,4] a lower frequency of 8%-14% was reported, but in other studies [5-12] a greater prevalence of 25%-30% was discovered. A metaanalysis of 27 studies on 4982 PCOS mothers found a 2.3 times increased risk of NICU admission [7]. In our study the incidence of congenital anomalies was 1.3% which is almost similar to two other Indian studies and a metaanalysis [8-13]. but a high prevalence of 6% was found in a study done in Australia which found that offspring born to PCOS mothers may have cardiovascular and urogenital defects [4].

In our investigation, one foetus had a cystic hygroma, while the other child born to a mother carrying twins had lungs that had hypoplasia. Our study's incidence of newborn fatalities was 0.7%, which is comparable to a study on 1789 PCOS-positive women conducted elsewhere [4] but lower than a retrospective matched cohort analysis conducted elsewhere [3]. Two more metaanalyses [8,9] have indicated an increase in risk of 1.5–1.8 times.

Overall, it seems that the proportion of poor maternal and perinatal outcomes is consistent with other research, although it differs from other trials done on PCOS-affected pregnant women. This study is one of the few from India to offer data on the success of pregnancies in PCOS-affected women and has a relatively bigger sample size. Additionally, our analysis includes singleton and multiple pregnancies as well as pregnancies conceived both naturally and using assisted reproductive technology. The study had two limitations: there was no comparison with a control pregnant population free of PCOS because the study sample was drawn from a tertiary hospital, and the pregnancy outcome might not represent all pregnant women with PCOS.

However, the proportion of GDM, miscarriage, preterm delivery, meconium stained liquor, caesarean delivery, small for gestational age/IUGR, macrosomia, PPROM, perinatal mortality, NICU admission, and congenital anomalies was found to be either similar or lower in pregnant women with PCOS in our study compared to those described in the general pregnant population.[16]

Conclusion

The results of our study provide further insight on how we now think about the prenatal and perinatal issues PCOS mothers encounter; some of our findings confirm and others contest some of the hazards associated with PCOS pregnancy. To investigate the degree of relationship between PCOS and the conflictingly poor maternal and perinatal outcomes of pregnancy, bigger cohort studies with longer follow-up are required.

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