

**Comparison of neonatal outcome in pregnant women with and without history of polycystic ovary syndrome**

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**Abstract**

**Background:** Polycystic ovarian syndrome (PCOS) in the present generation is a very common reproductive disorder and its prevalence is on the rise.

**Aim:** In this study we compare the fetal outcome in normal and women with PCOS.

**Methods:** This study was a case-control study conducted in Department of Obstetrics and Gynaecology, SMS Medical College and attached group of hospitals, Jaipur from May 2019 to Aug 2020.

**Results:** Mean birth weight of neonate in cases was  $2.43 \pm 0.31$  kg and in control group was  $2.71 \pm 0.29$  kg. The difference was statistically significant. Mean APGAR score at 1 minute in cases was  $6.21 \pm 1.23$  and in controls was  $7.21 \pm 0.24$ . APGAR score at 5 minute in PCOS group was  $7.89 \pm 1.40$  and in control group was  $8.12 \pm 0.21$ . The difference was statistically significant when compared. 12 neonates from the cases group were admitted in NICU.

**Conclusion:** With a detailed comparative analysis of this case-control study, it can be concluded that many fetal complications are per se increased in women with a history of PCOS

**Keywords:** NICU, APGAR, Birth Weight, PCOS

**Introduction**

Polycystic ovary syndrome (PCOS) is a multisystem endocrinopathy in women of reproductive age with various metabolic disturbances and a wide spectrum of clinical features like infertility, obesity, menstrual abnormalities and hyperandrogenism. The condition is relatively common and affects about 20% of women in reproductive age group. The diverse manifestations of PCOS start at puberty.<sup>1</sup>

Many studies have shown that PCOS is independently associated with an increased risk for short for gestational age (SGA) infants and observed in non-obese infertile women with PCOS who had undergone assisted reproductive technique (ART). Neonates born to women with PCOS also showed an increased risk for admission to the NICU. An APGAR score lower than seven at 5 min was more frequent in neonates born to women with PCOS.<sup>2</sup>

This study was undertaken to assess the fetal outcome in pregnant women with history of PCOS so that preventive measures can be instituted beforehand in these women and complications may be avoided.

### Aim

To study the adverse neonatal outcomes in women with polycystic ovary syndrome and compare with women without history of PCOS.

### Material & Methods

This was a case-control study designed prospectively with study population of pregnant women with between 5-28 weeks of period of gestation (POG) with previous history of PCOS treated as a case and pregnant women between 5-28 weeks without PCOS treated as control. They were followed-up till delivery in our hospital. A total of 125 women in each group were included.

### Inclusion Criteria

1. Pregnant women with h/o PCOS from 5-28 weeks of pregnancy
2. Those following the Rotterdam criteria (out of 3, 2 should be present): -
  - Ovulatory dysfunction such as oligomenorrhea or amenorrhea.
  - Clinical or biochemical evidence of hyperandrogenism.
  - Polycystic ovarian morphology on USG scan defined as presence of 12 or more cyst in size in any one ovary or both ovaries with enlarged ovaries (volume >10 cc).
3. Proper written and informed consent was taken.

### Exclusion Criteria

Medical disorders which can affect maternal outcome:- Decompensated heart disease, severe liver disease, chronic renal failure, acute fatty liver of pregnancy, fulminant hepatitis, severe anaemia, chronic hypertension, thyrotoxicosis, diabetes mellitus type 1 & 2, acute attack of bronchial asthma.

All pregnant women attending the antenatal clinic were inquired in detail about their present and past history regarding any illness, menstrual history and obstetric

history. Women giving history of oligo/ovulation were identified and their previous records were scrutinized. Those fulfilling the inclusion and Rotterdam criteria were taken as cases. Normal Pregnant women (without PCOS) between 5-28 weeks and fulfilling the exclusion criteria were treated as controls. Women in both the groups were subjected to a detailed general physical and systemic examination and few biochemical tests were done to exclude the conditions mentioned in the exclusion criteria.

### Statistical Analysis

Continuous variables were summarized as mean and was analyzed by using unpaired t test. Nominal / categorical variables were summarized as proportions and was analyzed by using chi-square/ Fischer exact test. p-value <0.05 considered as significant.

### Results

Out of 125 cases, 82 (65.60%) women were from 21-25 yrs of age group, 30 (24.00%) women were from 26-30 yrs age group, 10 (8.00%) women were more than 30 yrs of age and only 3 (2.40%) women were below 20 yrs of age. In Control group, out of 125 women, 66 (52.80%) women were between 21-25 yrs, 47 (37.60%) women from 26-30 yrs and 12 (9.60%) women from >30 yrs of age. Both groups were comparable. All the women in cases and control group were primigravida.

Table 1: Distribution of Women According to Mean Birth Weight of Neonate

Birth Weight (in kg)	Cases	Controls	p-value
Mean ± SD	2.43 ± 0.31	2.71 ± 0.29	0.01

Mean birth weight of newborns in women with history of PCOS was 2.43 ± 0.31 kg and in control group was 2.71 ± 0.29 kg. The difference was statistically significant.

Table 2: Distribution of Women According to Mean Apgar score in Neonates

APGAR Score	Cases	Controls	p-value
At 1 Min	6.21 ± 1.23	7.21 ± 0.024	0.01
At 5 Min	7.89 ± 1.40	8.12 ± 0.021	0.01

The mean APGAR score of newborn in case group at 1 minute was 6.21 ± 1.23 and in control group was 7.21 ± 0.024. APGAR score at 5 minute in PCOS group was 7.89 ± 1.40 and in control group was 8.12 ± 0.21. The difference was statistically significant.

Table 3: Distribution According to Admission in NICU

Admission in NICU	Cases		Controls	
	No.	%	No.	%
Present	12	10.34	2	1.61
Absent	104	89.66	122	98.39
Total	116	100.00	124	100.00

$p = 0.001$

In present study it was observed that 12 neonates from the cases group were admitted in NICU. Among these 7 had meconium aspiration syndrome and birth asphyxia, 3 were preterm births and 2 had IUGR. Among the control group, out of 2, 1 had birth asphyxia and IUGR and 1 had MAS.

### Discussion

Women with PCOS have an increased chance of maternal as well as fetal adverse pregnancy outcome. Studies clearly suggest a relation between pregnant PCOS women and adverse fetal outcome.

Kjerulff LE et al<sup>3</sup> and Lovvik TS et al<sup>4</sup> reported that women with twin pregnancies and PCOS diagnosis to have a higher risk of preterm birth, especially very preterm birth and spontaneous preterm birth, compared with women without PCOS. These neonates had low birth weight (47.7% in PCOS group v/s 39.3% in

Control group). Study conducted by Naver KV et al<sup>5</sup> reported that infants born to women with PCOS had low birth weight as compared to control group women. Study conducted by McDonnell R et al<sup>6</sup> found that perinatal outcomes of infants born to women with PCOS is significantly worse than those born to women without PCOS when meconium aspiration syndrome, low APGAR score at 1 and 5 minute and admission in NICU is taken into consideration.

However, one study has one result opposite to our study, Roos N et al<sup>7</sup> in their study found that infants born to mothers with previous diagnosis of PCOS were more often large for gestational age and also an increased risk of low APGAR score at 5 minute (OR - 1.41, CI - 1.09 to 1.83). They also found that PCOS was strongly associated with very preterm birth and risk of MAS was doubled. Neonates born to mothers with PCOS were likely to be large for gestational age and had a higher probability of birth asphyxia during labour than those born to unaffected mothers.

Similar observation was found by study Løvvik TS et al<sup>8</sup> and Mikola M et al<sup>9</sup> that the maternal and fetal both complications are more common in women with history of PCOS as compared to women without PCOS.

Higher NICU admission in the present study may be reflected by the routine policy of managing these infants at referral hospital.

### Conclusion

With a detailed comparative analysis of this case-control study, it can be concluded that many fetal complications are per se increased in women with a history of PCOS. Thus it is essential that this group of women should be identified preconceptionally or early in the antenatal period so that by increased vigilance, nutritional support and proper treatment, these complications can be taken care of.

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