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Original Research Article

A comparative study of antenatal and fetal complications in pregnant women with and without history of polycystic ovary syndrome

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ABSTRACT

Background: Polycystic ovary syndrome in the present generation is a very common reproductive disorder and the prevalence is on the rise. Aim of the current study was to compare the maternal 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 August 2020. Pregnant women with history of PCOS were taken as cases and with no such history were controls.
Results: 9.49% women developed gestational diabetes mellitus (GDM) in cases as compared to 1.61% women in control group. The difference in the incidence of GDM in the two groups was statistically significant. When hypertensive disorders of pregnancy were considered, a statistically significant difference was observed as 11.2% cases and 2.42% controls showed HDP. Mean birth weight of neonate in cases was 2.43±0.31 kg and in control group was 2.71±0.29 kg. Mean APGAR score at 1 minute in cases was 6.21±1.23 and in controls was 7.21±0.24. APGAR score at 5 minutes in PCOS group was 7.89±1.40 and in control group was 8.12±0.21. 12 neonates from the cases group were admitted in NICU. The difference was statistically significant when compared
Conclusions: With a detailed comparative analysis of this case-control study, it can be concluded that many antenatal and fetal complications are per se increased in women with a history of PCOS.

Keywords: Diabetes, HDP, PCOS, NICU, APGAR, Birth weight

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.[1] PCOS is characterized by chronic anovulation, oligomenorrhea or amenorrhea, hyperandrogenism and polycystic ovary morphology on pelvic ultrasound.[2]

Globally, the prevalence of PCOS ranges from 2.2% to 26%. Women with PCOS are at higher risk for insulin resistance, type 2 diabetes mellitus, obesity, dyslipidemia, hypertension.[3] 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.[4]

Aim

Current investigation was aimed at studying the antenatal period and any developing complications in women with history of polycystic ovary syndrome and comparing it with normal women.

METHODS

This was a case-control study designed prospectively with study population of pregnant women between 5-28 weeks of period of gestation with previous history of PCOS and pregnant women between 5-28 weeks without PCOS attending ANC and followed-up till delivering in Zanana hospital, department of obstetrics and gynaecology, SMS Medical college, Jaipur. A total 125 women in each group were included. This study was conducted over a period of 1 year from May 2019 to May 2020.

Inclusion criteria

Pregnant women from 5-28 weeks of pregnancy who were known cases of PCOS satisfying the rotterdams criteria (2/3 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 >10cc). Proper written and informed consent was taken.

Exclusion criteria

Medical disorders which could affect maternal outcome such as decompensated heart disease, severe liver disease, chronic renal failure, acute fatty liver of pregnancy, fulminant hepatitis, severe anemia, chronic hypertension, thyrotoxicosis, diabetes mellitus type 1 & 2, acute attack of bronchial asthma were taken as exclusion criteria.

Procedure

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/anovulation 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. Women in both the groups were matched for age and BMI.

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

Prevalence of abortion in PCOS group was 7.20% (9) and in control group was 0.80% (1). This difference was statistically significant. The abortion rate was significantly higher in PCOS group as compared to control group (Table 1).

Table 1: Distribution of women according to abortion.

Abortion	Cases		Controls	
	N	%	N	%
Present	9	7.20	1	0.80
Absent	116	92.80	124	99.20
Total	125	100.00	125	100.00

p=0.02.

Out of 116 women with PCOS, 11 (9.49%) women developed GDM as compared to 2 (1.61%) women in control group (Table 2).

Table 2: Distribution of women according to gestational diabetes mellitus.

Gestational diabetes mellitus	Cases		Controls	
	N	%	N	%
Present	11	9.49	2	1.61
Absent	105	90.51	122	98.39
Total	116	100.00	124	100.00

p=0.001.

This can also be attributed to the fact that few women in both groups had higher BMI. Women with PCOS have insulin resistance and development of GDM can be attributed to this. Total 13 (11.20%) women out of the 116 cases developed HDP as compared to 3 (2.42%) in control group (Table 3). Mean birth weight of new born 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 4). The mean APGAR score of new born in case group at 1 minute was

6.21±1.23 and in control group was 7.21±0.024. APGAR score at 5 minutes in PCOS group was 7.89±1.40 and in control group was 8.12±0.21. The difference was statistically significant (Table 5).

Table 3: Distribution of women according to hypertensive disorder of pregnancy (HDP) and pre-eclampsia.

HDP and pre-eclampsia	Cases		Controls	
	N	%	N	%
Present	13	11.20	3	2.42
Absent	103	88.80	121	97.58
Total	116	100.00	124	100.00

p=0.001.

Table 4: Distribution of women according to mean birth weight of neonate.

Birth weight (kg)	Cases	Controls	P value
Mean±SD	2.43±0.31	2.71±0.29	0.01

Table 5: Distribution of women according to mean APGAR score in neonates.

APCAR 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

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 (Table 6).

Table 6: Distribution according to admission in NICU.

Admission in NICU	Cases		Controls	
	N	%	N	%
Present	12	10.34	2	1.61
Absent	104	89.66	122	98.39
Total	116	100.00	124	100.00

p=0.001.

DISCUSSION

Women with PCOS have an increased chance of maternal as well as fetal adverse pregnancy outcome. The studies clearly suggest a relation between pregnant PCOS women and adverse maternal outcome. Study conducted by Palomba et al reported that the abortion rate was significantly higher in PCOS group as compared to control group.[4] Study conducted by Sha et al reported that women with PCOS had higher risk of early pregnancy loss (OR 1.41, 95% CI 1.04-1.91), as compared to control group.[5] Urman et al reported that women with PCOS had a significantly higher BMI as compared to the control group and risk of abnormal glucose challenge test and GDM was significantly increased in pregnant women with PCOS (p<0.5).[6] Toulis et al reported that women with PCOS demonstrated a significantly higher risk for the development of GDM compared with women without PCOS.[7] Veltman-Verhulst et al demonstrated that women with PCOS have a 3 fold risk of developing GDM compared with women without PCOS. Diamat et al demonstrated that the incidence of pre-eclampsia was much higher in women with PCOS as compared to women without PCOS.[9] de Vries et al reported that the incidence of pre-eclampsia was significantly higher in pregnant women with PCOS than in control group (p=0.02).[10] Radon et al found that women with PCOS were more likely to develop HDP when compared with age and weight matched controls (OR-15.0; 95% CI-1.9 to 121.5).[11] Kjerulff et al 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.[12] These neonates had low birth weight (47.7% in PCOS group vs. 39.3% in control group). Study conducted by Naver et al reported that infants born to women with PCOS had low birth weight as compared to control group women.[13]

Study conducted by McDonnel et al 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.[14] However, one study has one result opposite to our study, Roos et al 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).[15] Similar observation was found by study Løvvik et al and Mikola et al that the maternal and fetal both complications are more common in women with history of PCOS as compared to women without PCOS.

Limitations

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 antenatal and fetal complications are per se increased in women with a history of PCOS. Thus, women with history of PCOS should be identified either pre-conceptionally or during early gestation so that these women can be monitored closely and preventive measurements can be instituted timely to prevent complications.

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