

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20173625>

Original Research Article

## Polycystic ovarian syndrome and pregnancy outcome

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**Received:** 15 July 2017

**Accepted:** 24 July 2017

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### ABSTRACT

**Background:** Polycystic ovarian syndrome (PCOS) in the present generation is a very common reproductive disorder and the prevalence is on the rise. It is associated with typical features such as insulin resistance, hyperandrogenemia and obesity which has deep implications on the pregnancy outcomes as well as a long-term health of the woman.

**Methods:** Prospective comparative study performed over 200 pregnant women in the ESIC medical college, Bangalore. 100 women diagnosed with PCOS were compared with that of 100 normal women. The method of conception in pcos was recorded. maternal outcome in the form of abortion, gestational diabetes mellitus, hypertensive disorder in pregnancy, mode of delivery, intrapartum and postpartum complication. Fetal outcome in the form preterm delivery, small-for-gestational-age (SGA) infants, large-for-gestational-age infants, apgar at 5 minute and admission to NICU.

**Results:** Of the 100 women who were diagnosed with PCOS, 62 had spontaneous conception, 32 conceived with ovulation induction, 4 with artificial insemination and 2 needed IVF for conception. 18 women had spontaneous abortion, 58 were diagnosed with Gestational diabetes mellitus (GDM) predominantly between 24 – 28 weeks' period of gestation, 16 women had hypertension complicating pregnancy. Fetal outcome in the form of preterm birth was noted in 14 patients, large for gestation was noted in 11 newborns, the rate of NICU admission was significantly higher in the PCOS women's infants constituting 33%.

**Conclusions:** The assistance needed for conception was significantly higher in women with PCOS. The complications associated with pregnancy such as spontaneous abortions, gestational diabetes, hypertensive disorder in pregnancy, preterm births, need of NICU care for the infants are much higher in women with PCOS. Adult health education and the preconception diagnosis and appropriate management of PCOS is an important primary mode of prevention of these associated complications.

**Keywords:** Gestational diabetes mellitus, Hyperandrogenemia, Insulin resistance, Obesity, Polycystic ovarian disease, Preterm

### INTRODUCTION

In a developing country like ours, which is the diabetic capital of the world, Polycystic ovary syndrome (PCOS) is one of the top listed endocrine disorders in women between 13 to 40 years of reproductive age.<sup>1</sup> Prevalence of the disease is between 5 to 10%.<sup>2</sup> Stein and Levinthal was the first to describe the condition.<sup>3</sup> Rotterdam ESHRE/ASRM in the year 2003 standardized the

definition of PCOS, which is characterized by a combination of oligomenorrhea / amenorrhea, clinical or endocrine signs of hyperandrogenemia and polycystic ovaries.<sup>4</sup> 70% of the women suffer from normogonadotrophic anovulation, but with the presence of the ultrasound or endocrine features of PCOS.<sup>5</sup> More than 50% of women diagnosed with PCOS are overweight or obese.<sup>6</sup> This metabolic disorder is most commonly associated with infertility. 15-20% of the

women have miscarriages and up to 30-35% of them have early pregnancy losses. The late complication in pregnancy like gestational diabetes mellitus explained by 25-70% of the women with PCOS having insulin resistance, hypertension complicating pregnancy and prematurity.<sup>7</sup> PCOS is also associated with high incidence of cardiovascular disease later in life and developed type II diabetes or impaired glucose tolerance in the early 40's.<sup>7,8</sup>

The 'Barker hypothesis' explains that the fetal nutrition and endocrine environment affects the developing neuroendocrine systems leading to long term health hazards.<sup>9</sup> The low fertility in these women make it a must for them to have reproduction assistance like ovulation induction or IVF, putting them at the risk of developing multiple gestation.<sup>10,11</sup>

The objective of present study is to compare the mode of conception, need of reproductive assistance, maternal and fetal outcome in the form of spontaneous abortions, gestational diabetes, hypertensive disorders of pregnancy, preterm, birth weight and need of NICU care.

## METHODS

Prospective comparative study performed over 200 pregnant women in the ESIC medical college, Bangalore. 100 women attending the antenatal clinic without previous history or medical records of PCOS and no medical disorder were grouped as the control group and women with medical records in the form of ultrasound or blood parameters conclusive of PCOS were categories as the study group. Detailed history was taken of all the 200 women which including the age, parity, obstetric history, spontaneous or assisted conception, history of metformin intake, examination findings including BMI, facial hair, acne. Patients were labeled as GDM after performing 100 gms of glucose tolerance test (GTT) by the hexokinase method, and if 2 or more value was found to be abnormal.

Hypertensive disorders in pregnancy was diagnosed when the blood pressure was greater than 140/90 mm Hg after 20 weeks' period of gestation, on 2 or more occasions, and women with proteinuria were labeled as preeclampsia. Delivery prior to 37 weeks of gestation were labeled as preterm. When the birth weight was less than 2500 gms were termed low birth weight and birth weight of more than 4000 gms were macrosomia.

## RESULTS

The basic characteristic of both the population are depicted in Table 1.

Parameters such as age, obstetrics index, BMI, family and past history of blood sugar abnormality, history of abortion, mode of conception was compared and found to be significantly different in both the groups.

**Table 1: characteristics of the study population.**

Parameters	Number (100)
<b>Age (years)</b>	
20-24	26
25-29	48
30-34	16
≥35	10
<b>Parity</b>	
Primi	39
multi	61
<b>BMI</b>	
Normal weight	56
Over weight	39
Obese	5
<b>Mode of conception</b>	
spontaneous	62
Ovulation induction	32
IVF	2
Artificial insemination	4

The highest prevalence of PCOS, were in the between the age group 25 to 29 years, constituting to 48%. 39% were primigravida, 62% of the women conceived spontaneously.

Up to 38% of the women needed assistance in reproduction, 32% of the women conceived following ovulation induction, predominantly in the second cycle.

**Table 2: Maternal outcome.**

Parameters	Normal women	PCOS women	P value
Spontaneous miscarriage	6	18	>0.05
GDM	12	58	<0.05
Hypertensive disorders of pregnancy	7	16	>0.05
Preterm	6	14	<0.05

The Table 2 indicates the maternal outcome: 25% of the women had spontaneous miscarriage. The p value was found to be significant in relation to the prevalence of gestational diabetes which was as high as 58% in the PCOS women. 64% had a normal vaginal delivery and 36% had LSCS.

**Table 3: Fetal outcome.**

Parameters	Normal women	PCOS women	P value
Low birth weight	6	13	>0.05
Macrosomia	3	11	>0.05
NICU admission	7	33	<0.05

Table 3 shows fetal outcome, the p value was significant in the need of NICU care for the infants, predominantly due to preterm and low blood sugars.

## DISCUSSION

Present study conducted on a total of 200 pregnant women, 100 of who were among the women who had a history of PCOS (i.e. either in the form of scan or positive blood parameters). Age and parity distribution in both the groups were comparable. Out of 100 normal women, 21% landed with complications were as unto 60% of women with PCOS landed with antenatal complications.

Infertility was common among the PCOS patients, in our study. We noted that 38% women needed help in conceiving. Insulin resistance, hyperinsulinaemia and obesity are the common clinical features with women in PCOS. Women with PCOS were found to have an increased risk of carbohydrate metabolism impairment. The age of the patients in our case control study had no significant difference unlike in consensus with a study conducted by Haakoova et al and Setji et al whereas the weight difference were significantly different among both the groups.<sup>12,13</sup>

The maternal complications in the form of spontaneous abortion in our study was higher than the normal population, but the p value was not significant with was the same results obtained in a study conducted by Nivedhitha et al.<sup>14</sup> There was a considerable difference in the prevalence of the hypertensive disorder in pregnancy, but in comparisons to the normal population it was not statistically significant, which was the same results obtained by Setji et al.<sup>13</sup> Prevalence of Gestational diabetes is not only high among the women with PCOS but also statistically significant, upto 58% of the women were GDM of whom 84% were diagnosed between 24-28 weeks period of gestation, which was the same results found in a large number of study conducted by Haakoova et al, Setji et al and Lo JC et al.<sup>12,13,16</sup> Holter et al who conducted a large retrospective study found only a marginal increase in the risk of GDM, but no important difference in the rate of preeclampsia, but found that it had a direct relation to the body mass index of the patients.<sup>15</sup>

Boomsma performed GTT in the antenatal clinic in normal and PCOS patients and correlated with the weight of the women but found no significant difference, whereas we found a significant difference in the blood sugars and also women with PCOS developed GDM in the later second and early third trimester unlike the normal women who were all diagnosed in the third trimester.<sup>17</sup> The preterm prevalence was higher in the PCOS women but not significant which was the same results obtained by Nivedhitha et al and Boomsma et al.<sup>14,17</sup>

The rate of Caesarean Section Rate, we found no significant difference between PCOD women and normal women, in contrast to a study conducted by Bjercke S

et.al. who found a statistical significance in the need of caesarean section.<sup>18</sup>

The fetal outcome in terms of NICU admission was significantly higher in the babies born to the PCOS women with a p value of <0.05. The most common reason for the need of NICU care was preterm and neonatal hypoglycemia.

## CONCLUSION

The complication associated with PCOS is not just confined to reduced fertility but also pregnancy complications like spontaneous abortions, gestational diabetes, hypertensive disorders of pregnancy, fetal complication like low birth weight, increase need of NICU care, lower Apgar. Hence routine screening for blood sugar abnormalities, obesity, oligo menorrhoea is to be managed enthusiastically in adulthood. Meta-analysis has found that the Incorporation of metformin benefited in many PCOS women with infertility. Routine antenatal screening and early diagnosis of GDM and hypertensive disorders can provide a better fetal and maternal outcome.

*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:** Shivananjaiah C, Kannan A, Devi M, Jayanthi, Satish D, Ramaiah R. Polycystic ovarian syndrome and pregnancy outcome. *Int J Reprod Contracept Obstet Gynecol* 2017;6:3804-7.