

A Study Comparing the Risk of Adverse Pregnancy Outcomes in Women with and without Polycystic Ovarian Syndrome

MARIA AHMAD KHAN¹, UZMA HASAN², SYEDA HUSNA³, ABDUR REHMAN⁴

^{1,2,3}Senior Registrar, Nishtar Medical University, Multan

⁴Assistant Professor, Physiology, Niazi Medical and Dental College, Sargodha

Correspondence to: Maria Khan, Email: drmaria63@hotmail.com, Cell: 03346129414

ABSTRACT

Methodology: Researchers at Nishtar Hospital in Multan analysed data from 100 pregnant women who were enrolled in their antenatal care between the ages of 20 and 45. Fifty women were diagnosed with PCOS, while another 50 served as controls. Patients' demographic, clinical, menstrual, and pregnancy information was documented. We monitored maternal outcomes such as spontaneous abortion, GDM, preterm birth, and PIH from enrollment till delivery in all patients (PIH). SPSS Statistics 20.0 was the programme that was used for the statistical analysis.

RESULTS: The majority of the participants (59%) were between the ages of 20 and 30. The percentage of women with PCOS who had a high body mass index (BMI) was significantly higher than that of the control group, which was 38 percent. GDM occurred in 10(20%) with PCOS and 7(14%) in cases without PCOS, p-value=0.42, PIH in PCOS was 11(22%) whereas in controls it was 9(18%), p-value=0.62, preterm birth was higher in cases with PCOS i.e. 13(26%) and in controls 6(12%), p-value=0.07, Spontaneous abortions (SAB) occurred in 5(10%) in PCOS and 2(4%) in without PCOS, vaginal delivery was higher in controls i.e. 37(74%) where in PCOS it was 21(42%), cesarean delivery was recorded in 11(22%) in controls while 24(48%) in cases with PCOS, p-value=0.005.

Conclusion: PCOS pregnancy complications include SAB, GDM, and premature birth which were higher in PCOS group. Moreover, these pregnancies are at high-risk of pregnancy outcome and require frequent prenatal care.

Keywords: PCOS, pregnancy outcome, antenatal care

INTRODUCTION

Approximately 6-10% of reproductive-aged women worldwide suffer with polycystic ovarian syndrome (PCOS),¹⁻³ a complicated disorder with extremely varied clinical symptoms that increases the risk of infertility, poor pregnancy outcomes, endometrial cancer, and other disorders.^{4,5} The incidence of this morbidity is much higher among South Asian females, and in particular in Pakistani women. This is in contrast to the prevalence of PCOS in white populations (20–25 percent in the UK).⁶

It has been reported that the prevalence rate in Pakistan is 52%,⁷ with late diagnosis, infrequent medical follow-up, and a lack of understanding of the influence of lifestyle modifications all contributing to this high rate. However, reasons for the wide variation in incidence among regions include variations in diagnostic criteria, socioeconomic status, sample heterogeneity, medical care availability, health, education, and awareness in addition to other influential risk factors.⁸

PCOS differs from other ovulation failures characterised by anovulation and hypothalamic-pituitary-ovarian axis dysfunction due to inadequate ovarian follicle formation or insufficient gonadotropin production (or both) (not detected by routine examination). Polycystic ovary syndrome is characterised by endometrial hyperplasia. In addition to the aforementioned symptoms, PCOS has also been linked to metabolic syndrome, insulin resistance, and persistent low-grade inflammation.⁹

Possibilities for women with polycystic ovarian syndrome include infertility, postponed menopause, and possibly endometrial cancer (PCOS). Women who have PCOS are at a greater risk of developing metabolic syndrome, and it is also more likely that they will have additional risk factors for this condition. Some of the risk factors that contribute to metabolic syndrome include hypertension, central obesity, insulin resistance and atherosclerotic dyslipidemia.

Consequences such as type 2 diabetes, sleep apnea, cardiovascular disease, and psychological issues i.e. anxiety and depression are frequent in women with PCOS due to these risk factors.¹⁰ Women with PCOS and low fertility commonly seek ovulation induction or in-vitro fertilisation (IVF) despite the high risk of multiple pregnancies and related complications. Changes in lifestyle and the correction of metabolic and endocrine abnormalities can boost fertility. In contrast, there is a dearth of knowledge on the influence of PCOS on a woman's fertility within our community.

METHODOLOGY

This prospective research (case-control) was planned by the researchers at Nishtar Hospital, Multan, a tertiary care hospital in Southern Punjab, Pakistan, from July 2021 to December 2022. The pregnant women on antenatal visits at outpatient department regardless of PCOS status were the part of this research. Patients who matched the following exclusion criteria were not included in the study: hirsutism due to adrenal or other causes; anovulation for reasons other than PCOS; age >45; higher BMI(>35) for other than PCOS reason. Further, history of diabetes mellitus(DM), high blood pressure, or thyroid issues were also excluded. Women who were hyperandrogenic or who previously had a greater number of parity were also excluded. We did not include women who were involved in drug treatment. All participants were evaluated using the Rotterdam criteria before being enrolled to either the PCOS group or control group.

Researchers gathered data on the demographics of their subjects. The subjects' stature, BMI, blood pressure, and the presence or absence of hyperandrogenism were all documented during the clinical examinations of all subjects (for example, facial hair or acne). All of their demographic information was collected, including their age, parity, obstetric status, whether they conceived naturally or with medical assistance, and any medications they used during pregnancy. We also recorded details on their menstrual cycles, such as their onset, duration, blood loss, and the presence of any complications. About five or six weeks into their pregnancies, research participants started having regular checkups.

Women were screened for GDM using an OGTT consisting of 75 g of glucose. In order to establish a diagnosis of GDM, a blood glucose level of 140 mg/dL was required after glucose was administered for two hours. Following 20 weeks of gestation, PIH is diagnosed if the patient has hypertension on >2 occasions at least six hours apart, with or without proteinuria (PIH).

Preterm birth is defined as the delivery of a baby before 37 weeks of pregnancy. A spontaneous abortion (SAB) is the loss of a pregnancy before to the twentieth week of gestation. Maternal outcomes including SAB, preterm birth, GDM, and PIH were recorded for all pregnant women from their first antenatal check-up (ANC) following a missing period until delivery.

RESULTS

The majority of the participants (59%) were between the ages of 20 and 30. The percentage of women with PCOS who had a high body mass index (BMI) was significantly higher than that of the control group, which was 38 percent. GDM occurred in 10(20%) with PCOS and 7(14%) in cases without PCOS, p -value=0.42, PIH in PCOS was 11(22%) whereas in controls it was 9(18%), p -value=0.62, preterm birth was higher in cases with PCOS i.e. 13(26%) and in controls 6(12%), p -value=0.07, Spontaneous abortions (SAB) occurred in 5(10%) in PCOS and 2(4%) in without PCOS, vaginal delivery was higher in controls i.e. 37(74%) where in PCOS it was 21(42%), cesarean delivery was recorded in 11(22%) in controls while 24(48%) in cases with PCOS, p -value=0.005.

Table 1:

		Without PCOS(n=50)	With PCOS(n=50)	Total (100)	p-value
Age	20-30 years	31(62%)	28(56%)	59(59%)	0.68
	31-40 years	14(28%)	18(36%)	32(32%)	
	41-45 years	5(10%)	4(8%)	9(9%)	
BMI	18-25	15(30%)	10(20%)	25(25%)	0.01
	26-30	29(58%)	21(42%)	50(50%)	
	>30	6(12%)	19(38%)	25(25%)	
GDM		7(14%)	10(20%)	17(37%)	0.42
PIH		9(18%)	11(22%)	20(40%)	0.62
Preterm birth		6(12%)	13(26%)	19(38%)	0.07
SAB		2(4%)	5(10%)	7(7%)	0.005
Vaginal delivery		37(74%)	21(42%)	58(58%)	
Cesarean delivery		11(22%)	24(48%)	35(35%)	

DISCUSSION

In this research, pregnant women with and without polycystic ovarian syndrome (PCOS) were compared at a single medical institution using a prospective, matched-pairs comparison methodology. Since PCOS has a detrimental impact on ovulation and fertility, women who have the disorder have a greater risk of having their babies delivered prematurely than women who do not have PCOS.

We calculated 25.9 yrs as a the mean age comparable to other studies¹¹⁻¹³ (range: 20 to 45). Women who were part of the control group were less likely to make use of reproductive assistance than those who had PCOS. It has been claimed that the success rate of in vitro fertilisation is greater in women with PCOS than in women without PCOS, according to an Australian study¹¹ of women with PCOS.

Similarly with the results reported by De Frène et al¹⁴, observed that the prevalence of a body mass index (BMI) of 25 or more was considerably higher in the PCOS group than in the control group. This was the case even after controlling for factors such as age and race. In a retrospective cohort analysis, the researchers observed that women who suffered from PCOS had a higher body mass index (BMI; 33.3 kg/m²) than women who did not suffer from PCOS (26.11 kg/m²).¹⁴ A meta-analysis found that women who had PCOS had an increased chance of getting the disorder, and the results of this study add validity to that conclusion. The incidence of GDM was greater in the PCOS group compared to the control group.¹⁵ According to the results of our investigation, the prevalence of PIH was found to be comparable between the two groups. The findings of a significant study carried out in Australia¹⁶ indicated that women who suffered from PCOS had a higher rate of miscarriage when compared to those who served as controls.

Our findings are consistent with those of Naver et al.¹⁷ who found that PCOS mothers were more to give birth prematurely.

Pregnant women with polycystic ovary syndrome (PCOS) have an increased risk of premature birth, as shown in many meta-analyses.¹⁸ In our research, women with PCOS were more likely to have a C-section than other women. These findings are consistent with a meta-finding analysis's that women with PCOS had a much greater probability of having a caesarean section than those without PCOS.¹⁹

Our study's findings are limited in their generalizability because of the relatively modest size of our sample. Furthermore, PCOS has a variety of phenotypes, each with potentially unique negative consequences.

CONCLUSION

PCOS pregnancy complications include SAB, GDM, and premature birth which were higher in PCOS group. Moreover, these pregnancies are at high-risk of pregnancy outcome and require frequent prenatal care.

REFERENCES

- Deswal R, Narwal V, Dang A, Pundir CS. The Prevalence of Polycystic Ovary Syndrome: A Brief Systematic Review. *J Hum Reprod Sci* 2020;13:261-71
- Sharif E, Rahman S, Zia Y, Rizk NM. The frequency of polycystic ovary syndrome in young reproductive females in Qatar. *Int J Womens Health*. 2017;9:1-10
- Elham Sharif, Sumaya Rahman, Nasser M Rizk. The frequency of polycystic ovary syndrome in young reproductive females in Qatar. *Int J Women Health* 2017;9:1-10
- Chen T, Yu Y, Liu X. The relationship between polycystic ovary syndrome and insulin resistance from 1983 to 2022: A bibliometric analysis. *Front Public Health* 2022;10:960965.
- Mills G, Badeghiess A, Suarhana E, Baghlaif H. Dahan MH. Associations between polycystic ovary syndrome and adverse obstetric and neonatal outcomes: a population study of 91 million births. *Hum Reprod*. (2020) 35:1914–21.
- Azhar A, Abid F, Rehman R. Polycystic Ovary Syndrome, Subfertility and Vitamin D Deficiency. *J Coll Physicians Surg Pak* 2020; 30(05):545-546. DOI: <https://doi.org/10.29271/jcpsp.2020.05.545>.
- Zulfqar S, Tahir S, Gulraiz S, Razzaq MA, Abid A, Shahid T, Babar A, Rehman B, Rafique H, Noor S, Anjum I. Investigation of Prevalence and Awareness of Polycystic Ovary Syndrome among Pakistani Females: Polycystic Ovary Syndrome in Pakistani Women. *Proceedings of the Pakistan Academy of Sciences: Part B (Life and Environmental Sciences)*. 2022 Jun 23;59(1):77-83
- Bozdag G, Mumusoglu S, Zengin D, Karabulut E, Yildiz BO. The prevalence and phenotypic features of polycystic ovary syndrome: A systematic review and meta-analysis. *Hum Reprod* 2016;31:2841-55. Back to cited text no. 28
- Abdalla MA, Deshmukh H, Atkin S, Sathyapalan T: A review of therapeutic options for managing the metabolic aspects of polycystic ovary syndrome. *Ther Adv Endocrinol Metab*. 2020, 11:2042018820938305. [10.1177/2042018820938305](https://doi.org/10.1177/2042018820938305)
- Chandrasekaran S, Sagili H. Metabolic syndrome in women with polycystic ovary syndrome. *Obstet Gynaecol* 2018;20(4):245–52. doi: 10.1111/tog.12519
- Doherty DA, Newnham JP, Bower C, Hart R: Implications of polycystic ovary syndrome for pregnancy and for the health of offspring. *Obstet Gynecol*. 2015, 125:1397-406. [10.1097/AOG.0000000000000852](https://doi.org/10.1097/AOG.0000000000000852)
- Yu HF, Chen HS, Rao DP, Gong J: Association between polycystic ovary syndrome and the risk of pregnancy complications: a PRISMA-compliant systematic review and meta-analysis. *Medicine (Baltimore)*. 2016;95:10.1097/MD.0000000000004863
- Puvithra T, Pandiyan R, Pandiyan N: Pregnancy complications - consequence of polycystic ovary syndrome or body mass index?. *Chettinad Health Med J*. 2017, 6:04-8.
- De Frène V, Vansteelandt S, T'Sjoen G, Gerris J, Somers S, Vercruyse L, De Sutter P: A retrospective study of the pregnancy, delivery and neonatal outcome in overweight versus normal weight women with polycystic ovary syndrome. *Hum Reprod*. 2014, 29:2333-8. [10.1093/humrep/deu154](https://doi.org/10.1093/humrep/deu154)
- Toulis KA, Goulis DG, Kolibianakis EM, Venetis CA, Tarlatzis BC, Papadimas I: Risk of gestational diabetes mellitus in women with polycystic ovary syndrome: a systematic review and a meta-analysis. *Fertil Steril* 2009, 92:667-77. [10.1016/j.fertnstert.2008.06.045](https://doi.org/10.1016/j.fertnstert.2008.06.045)
- Joham AE, Boyle JA, Ranasinha S, Zoungas S, Teede HJ: Contraception use and pregnancy outcomes in women with polycystic ovary syndrome: data from the Australian Longitudinal Study on Women's Health. *Hum Reprod*. 2014, 29:802-8. [10.1093/humrep/deu020](https://doi.org/10.1093/humrep/deu020)
- Naver KV, Grinsted J, Larsen SO, Hedley PL, Jørgensen FS, Christiansen M, Nilas L: Increased risk of preterm delivery and pre-eclampsia in women with polycystic ovary syndrome and hyperandrogenaemia. *BJOG* 2014, 121:575-81. [10.1111/1471-0528.12558](https://doi.org/10.1111/1471-0528.12558)
- Kjerulff LE, Sanchez-Ramos L, Duffy D: Pregnancy outcomes in women with polycystic ovary syndrome: a meta-analysis. *Am J Obstet Gynecol*. 2011, 204:1-6. [10.1016/j.ajog.2011.03.021](https://doi.org/10.1016/j.ajog.2011.03.021)
- Boomsma CM, Eijkemans MJ, Hughes EG, Visser GH, Fauser BC, Macklon NS: A meta-analysis of pregnancy outcomes in women with polycystic ovary syndrome. *Hum Reprod Update*. 2006, 12:673-83.