Pregnancy Outcomes in Women with Polycystic Ovarian Syndrome

Nawal Kamal Abd Elkhalek, Sayed Ahmed Mohamad Taha, Entisar Mohammad Younes & Sahar Fahmy Alsaid Gawad.

Assistant lecturer of Obstetrics and Gynecology Faculty of Nursing, South Valley University Egypt.
Prof. of Obstetrics and Gynecology, Faculty of Medicine, South Valley University Egypt.
Assistant Prof. of Obstetrics and Gynecology Faculty of Nursing Egypt.
Assiut University Lecturer of Obstetrics and Gynecology, Faculty of Nursing, South Valley University Egypt.

Abstract

Background: Polycystic ovary syndrome (PCOs) is a common genetic and endocrine disorder affecting 5-10% of women at reproductive age. **Aim** was to assess pregnancy outcomes of pregnant women with PCOs. **Subjects and methods:** Comparative descriptive cross-sectional study design was conducted in the labor ward of Obstetrics and Gynecology, Qena University and Qena General Hospital. Convenient sample were 120 pregnant women with PCOs and other 600 pregnant women without PCOs. Data collected by structured interview questionnaire, maternal and neonatal assessment sheet. **Results** of the study found that pregnancy with PCOs was associated with significantly higher rates of maternal complications as hypertension (14.2%), gestational diabetes mellitus (10.8%), preeclampsia (4.2%), preterm delivery (5%) and cesarean delivery (79.2%) versus (0.7%), (0.7%), (2.3%), (1.7%) and (53.8%) in the non PCOs group. Neonatal complications as APGAR score of less than 7 (19.2%), macrosomia (9.2%), respiratory distress (20.8%) and admission to neonatal intensive care unit (4.3%) versus (2.2%), (3.2%), (6.2%) and (20.8%) in the non PCOs group with highly statistical significant relationship among both groups. **Conclusions:** This study confirmed higher association of pregnancy complications among PCOs group compared with non PCOs group. **Recommendations:** women with PCOs should be followed up for complications on pregnancy and neonatal outcomes.

Key words: Pregnancy Outcomes & PCOs with Pregnancy.

Introduction

Polycystic ovarian syndrome is the most frequently encountered endocrinopathy in woman of reproductive age. It has significant reproductive and non reproductive consequences **(Kieler et al., 2011&Fauser et al., 2013)**.

Polycystic ovary syndrome is a common heterogeneous, multifactorial, complex genetic and endocrine disorder affecting 5 - 10% of women of reproductive age. Anovulation is the cause of infertility in about one third of couples seeking treatment and PCOs accounts for 90% of these cases. Clinical manifestations of PCOs include irregular menses, hirsutism and acne. In addition, Insulin resistance (IR) and hyperinsulinemia play a central role in the pathophysiology of PCOs. Early pregnancy loss has also been reported to occur in 30 - 50% of women with PCOs, which is 3-fold higher than in healthy women **(ESHRE, 2008, Allahbadia & Merchant, 2011, Morin-Papunenet al., 2012 & NICE, 2013).**

The best current definition of PCOs is that generated at Rotterdam according to the revised European Society of Human Reproduction and Embryology and the American Society for Reproductive Medicine criteria of 2004, which concluded that, the existence of two of the following three criteria to make the diagnosis, oligoovulation and / or anovulation, excess androgen activity and polycystic ovaries by gynecologic ultrasonography **(Christine et al., 2010 & Motta, 2010)**.

The exact aetiology of PCOs is complex and remains largely unclear. Although a detailed discussion is beyond the scope of this review, hormonal imbalance created by a combination of increased androgens and/or insulin underpin PCOs. Genetic and environmental contributors to hormonal disturbances combine with other factors, including obesity, ovarian dysfunction and hypothalamic pituitary abnormalities. Hyperandrogenism is a well established contributor to PCOs etiology, detected in around 60 % to 80 % of cases. Insulin resistance is a pathophysiological contributor in around 50% to 80% of women with PCOs, especially in those who are overweight. Conversely, lean women appear to have less severe hyperinsulinaemia and IR **(Teede et al., 2010 & Jones, 2012).**

Women with PCOs had a significantly higher risk of experiencing gestational diabetes mellitus GDM, pregnancy induced hypertension (PIH), preeclampsia (PET) and preterm birth. There is also an association

between PCOs and increased obstetric intervention, mainly, iatrogenic prematurity and caesarean section (CS). Additionally, infants of women with PCOs also had a significantly higher risk of preterm delivery, stillbirth, low APGAR score (< 7 at five minutes), meconium aspiration, large for gestational age, macrosomia, small for gestational age, admission to NICU and a higher perinatal mortality rate that was unrelated to multiple births. **(Altieri et al., 2010, Li et al., 2010, Kieler et al., 2011 & Kjerulff et al., 2011).**

Treatment of PCOs depends on the presenting symptoms and on wishes of the woman. If there are no symptoms no treatment is indicated. Lifestyle changes should be encouraged and obese woman persuaded to seek help from an experienced dietitian. If the woman wishes to conceive then metformin, which acts by reducing hepatic glucose production and increasing peripheral tissue sensitivity, and or/clomiphene citrate can be used to induce ovulation. They should be screened for glucose intolerance preferably before conception and certainly during early pregnancy. Women with PCOs should be followed up, as over 20 % will be found to have, or will develop, impaired glucose tolerance (IGT) or DM. They also have an increased risk of developing endometrial carcinoma if anovulation persists for a number of years **(Motta, 2010 & Jones, 2012).**

Nurses have an important role in management of PCOs. Nursing assessment for women with PCOs includes health history, physical examination and diagnostic tests **(Ricci, 2009).**

Nursing care should include counseling and education about the condition, treatment options, diagnostic test arrangements, and referral for surgery if needed. Provide support and reassurance during the diagnostic period to allay client and family anxiety. Stress the importance of follow-up care. Listen to the women's concern about her appearance, infertility and facial hair growth. Offer suggestion to help the women feel better about herself and her health **(Ricci, 2009 and London et al., 2011).**

Significance of the Study

Polycystic ovary syndrome has been noted to affect 4 % to 8 % from studies performed in Greece, Spain and the USA, 6.3 % in Sri Lanka, 46.8 % in New Delhi, 9.13 % in Andhra and India, 26.4 % in Kerala, 2.4 in China, 14.6% in Iran, 14.8% in Germany and 17.8% in Australia **(March et al., 2010, Teede et al., 2010, Tehrani et al., 2011, Macut et al., 2013 & Vijayan & Sonia, 2013).**

By reviewing the literature and researches the investigator observed that, high rate of PCOs affect pregnancy. As reported in population-based studies, approximately 50 % of women with PCOs are overweight or obese. There were adverse pregnancy outcomes with PCOs. They were include maternal outcomes as early pregnancy loss, impaired glucose tolerance, gestational diabetes mellitus, pregnancy induced hypertension, preeclampsia, increased obstetric intervention as caesarean section and fetal outcomes as preterm birth, stillbirth, neonatal death, low APGAR score of less than 7 at five minutes, meconium aspiration, large for gestational age, macrosomia and small for gestational age **(Kieler et al., 2011, Kjerulff et al., 2011 & Moran et al., 2011).**

Aim of the study

The aim of this study was to assess the pregnancy outcomes of the pregnant women with PCOs.

Subjects and methods

Research design

A comparative descriptive cross-sectional study design was utilized in this study.

Research setting: The study was conducted in labor ward of Obstetrics and Gynecology Department, Qena University and Qena General Hospital. The two settings provide free services to rural and urban clients in Qena Governorate and other nearest cities.

Sample size

The sample size was selected by convenient purposive sampling by EPI INFO, 2000 statistical package according to equation of sample size for descriptive study design, $\mathbf{n = Z_1 - a / 2p (1 - p) / d2}$ **(Bhalwar, 2009)**. The convenient sample was estimated to be 600 women in the non PCOs group and 120 women in the PCOs group. Women who attended the Qena University and Qena General Hospital were with labor pain.

Subjects

The estimated number of women who attended the labor ward were included in the study. These women came to the hospital with labor pain.

They are divided into two main groups.

1. **Group A (Non PCOs group):** Which included all women who has normal pregnancy.
2. **Group B (PCOs group):** Which included women who had been delayed conception for more than one year and diagnosed with PCOs.

Sample characteristics

The sample was chosen according to the following criteria:

Inclusion criteria

1. **Group A:** All pregnant women who had been pregnant normally with no previous history of PCOs.
2. **Group B:** All pregnant women who had been pregnant after one year of being married and with previous history of PCOs.

Exclusion criteria for all women

1- Previous history of hypertension.
2- Previous history of diabetes mellitus.
3- Women who are infertile for other causes.

Tools of data collection

After reviewing the literature and researches which were relevant to the present study a structured interview questionnaire was designed.

The questionnaire consisted of different parts.

The first part which contained

1) Socio-demographic data such as mother's name, age, education, occupation, residence and telephone number. 2) Medical history which included history of chronic diseases as, hypertension and DM. 3) Family history which included family history of PCOs, hypertension, DM, multiple pregnancy and congenital anomalies. 4) Menstrual history such as age of menarche, duration, interval, rhythm and pattern of menstrual cycle. 5) Obstetric history such as number of gravidity, parity, abortion and number of stillbirth. 6) The previous pregnancy and previous labor either it was normal or complicated. 7) Mode of delivery either it was spontaneous vaginal delivery (SVD), operative vaginal delivery (OVD), instrumental or C.S.

The second part which involved

1) Data related to the current pregnancy which includes the last menstrual period (LMP) and the expected date of delivery (EDD). 2) Duration of infertility and clinical signs of hyperandrogenism. 3) Method of conceiving. 4) History of maternal outcome such as number of ante natal visits either it was less than four or more. 5) The current pregnancy either it was normal or complicated. 6) The present labor either it was normal or complicated. 7) Mode of delivery either it was SVD, OVD, Instrumental or C.S.

Maternal assessment part

This part is the assessment part and included:

1) Maternal assessment like blood pressure and pulse rate. 2) Abdominal examination which included weeks of gestation and fetal kick counts either it was normal or decreased. 3) Body mass index (BMI) either it was lean (less than 20), normal (20 up to Less than 25), overweight (25 up to less than 30) or obese (30 or more). 4) Urine analysis for sugar and albumin. 5) Ultrasonography report to determine if the pregnancy outcome is single or multiple.

Neonatal assessment part

This part is the neonatal assessment and included:

Fetal assessment to determine the APGAR score at first and five minutes, birth weight, length, head circumference, respiratory distress, meconium aspiration, macrosomia, jaundice, neonatal malformation and admission to NICU.

Administrative design

Awritten official permission clarifying the purpose of the study was Obtained from the director of Qena University and the director of Qena General Hospital.

Pilot study

A pilot study was implemented on 10 % of women included in the study which was equal to 60 women with non PCOs and 12 women with PCOs to ascertain the relevance of the tools, estimate the length of the time needed to fill the sheet and to evaluate the questionnaire validity and reliability and accordingly necessary modifications was done. Some items were added to the appendix as required. The modifications were done and women included in the pilot study were included in the total sample.

Implementation phase (procedure)

All the studied women of the two groups were interviewed by the investigator in face-to-face communication to explain the nature of the study, its importance, procedures to be done and obtain consent to collect the data which related to the study tool.

The investigator took the history of the present pregnancy, measure the blood pressure and pulse rate, perform abdominal examination to assess the fundal level to calculate gestational age assessing the presence of edema, assess the fetal heart rate (FHR) for identifying fetal distress, reviewing fetal movement counts by asking the mother about the number of fetal movements per day, urine analysis for albumin and sugar and weighing the mother to calculate the BMI. Also sonographic examination was done by the physician to assess the gestational age, FHR, baby's weight, amount of amniotic fluid and the pregnancy outcome (single or multiple). The interview took about 20 to 30 minutes.

The investigator also attend the labor process either it was normal vaginal delivery or by CS. The investigator assess the APGAR score of the newborn at the first minute and after five minutes, take newborn's birth weight, length, head circumference, observe respiratory distress, meconium aspiration, macrosomia, low birth weight (LBW), jaundice, neonatal malformations and if the new born needed to be admitted to neonatal intensive care unit (NICU) or not.

Statistical analysis and interpretation

The data were entered using the data manager computer program, tabulated and analyzed by computer statistical programs (SPSS version 20). Descriptive statistics were calculated e.g., frequency, percentage and standard deviation, correlation coefficient, chi square test was used to identify difference in distribution of frequency between groups. Significant P-Value was considered when P-Value equals or less than 0.05 and high significant when P-Value was less than or equal 0.001

Results

Table (1): Distribution of the studied women according to their personal data.

Personal data	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
Age Groups					0.587
Less than 25 years	262	43.7	47	39.2	
25 - less than 30 years	172	28.7	39	32.5	
30 - less than 35	121	20.2	22	18.3	
35 years and more	45	7.5	12	10.0	
Range	17 – 45		17 – 42		0.223
Mean ± SD	26.3 ± 5.2		26.9 ± 5.0		
Level of education					0.436
Illiterate	156	26	27	22.5	
Read and write	16	2.7	5	4.2	
Basic education	113	18.8	26	21.7	
Secondary education	249	41.5	54	45	
University education	66	11	8	6.7	
Occupation					0.924
Employed	19	3.2	4	3.3	
Housewife	581	96.8	116	96.7	
Residence					0.817
Urban	151	25.2	29	24.2	
Rural	449	74.8	91	75.8	

Table (2): Distribution of the studied women according to their family history of medical disorder.

Family history	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
Family history of PCOs					0.001
Yes	41	6.8	37	30.8	
No	559	93.2	83	69.2	
Hypertension					
Yes	171	28.5	32	26.7	0.684
No	429	71.5	88	73.3	
Diabetes mellitus					0.885
Yes	184	30.7	36	30	
No	416	69.3	84	70	
Multiple pregnancy					0.006
Yes	196	32.7	24	20	
No	404	67.3	96	80	
Congenital anomalies					0.121
Yes	43	7.2	4	3.3	
No	557	92.8	116	96.7	

Table (3): Distribution of the studied women according to their obstetrical history.

Obstetrical history	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
Gravidity					0.001
Primigravida	189	31.5	69	57.5	
Multigravida	411	68.5	51	42.5	
Parity					0.001
Nulliparaous	219	36.5	73	60.8	
Primipara	152	25.3	24	20	
Multipara	229	38.2	23	19.2	
Abortion					0.046
None	437	72.8	98	81.7	
Once	97	16.2	15	12.5	
2 – 3	59	9.8	4	3.3	
4 or more	7	1.2	3	2.5	
Still birth					0.900
None	589	98.2	118	98.3	
Once	11	1.8	2	1.7	

Table (4): Distribution of the studied women according to the assessment data.

Assessment data	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
Blood pressure					0.001
Normal B.P.	575	95.8	77	64.2	
Hypertension	25	4.2	43	35.8	
Pulse					NA
Less than 60 b/min	0	0	0	0	
60 - 100 b/min	100	100	100	100	
More than100 b/min	0	0	0	0	
Mean ± SD	76.4 ± 6.9		76.6 ± 7.4		0.794
B M I					0.001
Less than 20	63	10.5	2	1.7	
20 - less than 25	427	71.2	42	35	
25 - less than 30	76	12.7	28	23.3	
30 or more	34	5.7	48	40	
Glucose level					0.001
Normal	594	99	88	73.3	
Hyperglycemia	6	1	32	26.7	
Albumin level					0.001
Normal	578	96.3	94	78.3	
Presence of albumin	22	3.7	26	21.7	

Table (5): Distribution of the studied women according to the current pregnancy outcomes.

Current pregnancy outcomes	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
The current pregnancy condition					0.001
Normal pregnancy	454	75.7	26	21.7	
Complicated pregnancy	146	24.3	94	78.3	
Type of complications					0.001
Hypertension	4	0.7	17	14.2	
DM	4	0.7	13	10.8	
Preeclampsia	14	2.3	5	4.2	
Eclampsia	3	0.5	2	1.7	
PROM	15	2.5	9	7.5	
Anemia	52	8.7	9	7.5	
Oligohydraminos	7	1.2	0	0	
Polyhydraminos	2	0.3	0	0	
Placenta previa	24	4	2	1.7	
Others	5	0.8	1	0.8	0.582
More than one complication	16	2.7	36	30	0.001

Table (6): Distribution of the studied women according to the current labor outcomes.

Current labor outcomes	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
Labor status					0.001
Normal labor	479	79.8	60	50.0	
Complicated labor	121	20.2	60	50.0	
Type of complications					0.001
Preterm birth	10	1.7	6	5	
Post term	5	0.8	5	4.2	
Still birth	6	1	2	1.6	
Macrosomic fetus	19	3.2	11	9.2	
Other complications	52	8.7	26	21.7	0.001
More than one complication	29	4.8	10	8.3	0.001
Mode of delivery					0.001
SVD	143	23.8	12	10	
OVD	128	21.3	13	10.8	
Instrumental	6	1	0	0	
C.S	323	53.8	95	79.2	

Table (7): Distribution of the studied women according to their neonatal outcomes among both groups.

Neonatal outcomes	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
APGAR at the first min					
Less than 7	13	2.2	23	19.2	0.001
7 or more	581	96.8	95	79.2	
Mean ± SD (score)	8.1± 0.66		7.6 ± 1.0		
APGAR at 5 min					0.525
7 or more	594	99.0	118	98.3	
Mean ± SD (score)	9.9 ± 0.34		9.7 ± 0.45		0.002
Birth weight					
Less than 2500 gm	23	3.8	11	9.2	0.002
2500 - 3500 gm	546	91	96	80	
More than 4000 gm	25	4.2	11	9.2	
Mean ± SD (gm)	3085.8 ± 516.5		3056.8 ± 553.6		0.515
Length					
Less than 46 cm	26	4.3	14	11.7	<0.001
46 - 51 cm	568	94.7	99	82.5	
More than 51 cm	0	0	5	4.2	
Mean ± SD (cm)	49.0 ± 2.1		48.4 ± 3.5		0.054
Head circumference					
Less than 32 cm	31	5.2	16	13.3	0.003
32 - 36 cm	491	81.8	87	72.5	
More than 36 cm	72	12	15	12.5	
Mean ± SD (cm)	34.1 ± 1.4		33.6 ± 2.2		0.037

Table (8): Distribution of the studied women according to their neonatal conditions among both groups.

Neonatal conditions	G. A (No = 600)		G. B (No = 120)		P. value
	No.	%	No.	%	
Respiratory distress	37	6.2	25	20.8	0.001
Meconium aspiration	15	2.5	3	2.5	0.374
Macrosomia	25	4.2	11	9.2	0.039
LBW	23	3.8	11	9.2	0.027
Neonatal malformation	12	2	3	2.5	0.766
Type of malformation					
Cleft lip	5	0.8	2	1.7	0.585
Cleft palate	3	0.5	0	0	
Others	4	0.7	1	0.8	
Others					0.576
Hypospodious	3	0.5	1	0.8	
Hydrocele	1	0.2	0	0	
Admission to NICU	26	4.3	25	20.8	<0.001

Table (9): The relationship between age and pregnancy outcomes.

Current pregnancy outcomes	Group A				Group B				P. value
	Less than 30 years		30 years or more		less than 30 years		30 years or more		
	No.	%	No.	%	No.	%	No.	%	
Pregnancy outcomes									
Single	430	99	160	96.4	79	91.9	34	100	0.05
Multiple	4	1	6	3.6	7	8.1	0	0	0.011
The current pregnancy condition									
Normal	330	76	124	74.7	18	21	8	23.5	0.027
Complicated	104	24	42	25.3	68	79	26	76.5	0.035
Type of complications									
Hypertension	4	0.9	0	0	10	11.6	7	20.6	0.016
DM	0	0	4	2.4	11	12.8	2	5.8	0.002
Preeclampsia	7	0.7	7	4.2	2	2.3	3	8.8	0.017
Eclampsia	2	0.2	1	0.6	1	1.1	1	2.9	0.045
PROM	14	3.2	1	0.6	9	10.5	0	0	0.012
Anemia	37	8.5	15	9	7	8.1	2	5.8	0.002
Oligohydrominos	6	1.4	1	0.6	0	0	0	0	NA
Polyhydrominos	2	0.5	0	0	1	1.1	0	0	NA
Placenta previa	16	3.7	8	4.8	2	2.3	0	0	0.03
Others	5	1.1	0	0	0	0	0	0	NA
More than one	11	2.5	5	3	25	29	11	32.5	0. 02

Table (10): The relationship between age and labor outcomes.

Current labor outcomes	Group A				Group B				P. value
	Less than 30 years		More than 30 years		Less than 30 years		More than 30 years		
	No.	%	No.	%	No	%	No	%	
Current labor status									
Normal	343	79	136	82	40	46.5	20	58.8	0.042
Complicated	91	21	30	18	46	53.5	14	41.2	0.028
Type of complications									
Preterm birth	10	2.3	0	0	5	5.8	1	3	0.018
Post term	5	1.1	0	0	5	5.8	0	0	NA
Still birth	1	0.2	5	3	2	2.3	0	0	0.035
Macrosomia	13	3	6	3.6	10	11.6	1	3	0.016
Others	39	9	13	7.8	18	21	8	23.5	0.05
More than one	23	5.3	6	3.6	6	7	4	11.7	0.022

Table (1) : shows that there is no statistical significant difference in the personal data between the non PCOs and the PCOs group. The mean age of the women in the non PCOs group is (26.3 $\pm$ 5.2) and (26.9 $\pm$ 5) in the PCOs group with no statistical significant difference among both groups (p = 0.223). Regarding to education, around half of them were with secondary education (41.5 %), most of them were house wives (96.8 %) and most of them were from rural area (74.8 %) in the non PCOs group versus (Vs) (45 %), (96.7 %) and (75.8 %) in the PCOs with no statistical significant difference among both groups (p=0.436).

Table (2) : shows that there is a highly statistical significant relationship in the family history of PCOs among both groups (p = 0.001). In the non PCOs group represents (6.8 %) Vs (30.8 %) in the PCOs group.

Table (3) : shows that there is highly statistical significant relationship in the gravidity among both

groups (p = 0.001). Primigravida represents (31.5%) in the non PCOs group. The table also shows that there is statistical significant relationship in abortion among both groups (p = 0.046). Most of the women have no history of abortion (72.8 %) in the non PCOs group and (81.7 %) in the PCOs group.

Table (4) : shows that there is highly statistical significant relationship in the blood pressure among both groups (p = 0.001). The table also shows that there is a highly statistical significant relationship in the BMI among both groups (p = 0.001).

Table (5) : shows that normal pregnancy represents (75.7%) of the non PCOs group Vs (21.7%) in the PCOs group with a highly statistical significant relationship in the current pregnancy among both groups (p=0.001). Regarding to the type of complication, hypertension complicates (0.7%), DM (0.7%), preeclampsia (2.3%), Eclampsia also complicates (0.5 %), PROM complicates (2.5%), anemia complicates (8.7 %) and more than one complain complicates (2.7%) of cases of the non PCOs group Vs (14.2%), (10.8%), (4.2%), (1.7%), (7.5%), (7.5%) and (30%) of the PCOs group respectively with a highly statistical significant relationship (p = 0.001).

Table (6) : shows that there is a highly statistical significant relationship in the current labor among both groups (p = 0.001). Normal labor represents (79.8%) in the non PCOs group Vs (50%) in the PCOs group. The table also shows that there is a highly statistical significant relationship in the type of complications among both groups (p=0.001).

Table (7) : shows that there is highly statistical significant relationship in the APGAR score at the first minute among both groups (p = 0.001). The table also shows that there is highly statistical significant relationship in the birth weight among both groups (p = 0.002).

Table (8) : shows that there is highly statistical significant relationship in the fetal distress among both groups (p = 0.001). The table also shows that there is statistical significant relationship in macrosomia and LBW among both groups (p=0.039) and (p = 0.027) respectively. Also the table shows that there is highly statistical significant relationship in the admission to NICU among both groups (p=0.001).

Table (9) : shows that there is a statistical significant relationship in the pregnancy outcomes and age groups among both groups (p = 0.011). Multiple pregnancy represents (8.1 %) in the age group of less than 30 years and (0 %) in the age group of 3o years or more in the PCOs group Vs (1 %) and (3.6 %) in the non PCOs group respectively.

Table (10) : shows that there is a statistical significant relationship in the labor outcomes and age groups among both groups (p = 0.028). Complicated labor represents (53.5 %) in the age group of less than 30 years and (41.2 %) in the age group of 3o years or more in the PCOs group Vs (21 %) and (18 %) in the non PCOs group respectively.

Discussion

The aim of the present study was to assess pregnancy outcomes of pregnant women with PCOs.

Polycystic ovary syndrome is associated with reproductive (hyperandrogenism, menstrual irregularity, anovulation, infertility and increased pregnancy complications), psychological (impaired quality of life and increased anxiety and depression) and metabolic (increased risk factors for IGT, DM and cardiovascular disease) sequelae. The main outcome measures risk of adverse pregnancy outcomes with PCOs include IGT, GDM, PIH, PET, preterm birth, stillbirth, neonatal death, low APGAR score, meconium aspiration, large for gestational age, macrosomia and small for gestational age, There is also an association between PCOs and increased obstetric intervention, mainly CS. Adjusted for maternal characteristics, (body mass index and age), socioeconomic factors (educational level, and cohabitating with infant's father) and assisted reproductive technology **(Moran et al., 2010, Kieler et al., 2011 and Kjerulff et al., 2011).**

This aim was significantly supported by the present study research question because the present study revealed that there is no statistical significant difference in the personal data between the non PCOs and PCOs group (p = 0.223). The study also showed that the majority of the non PCOs group and the PCOs group were within the age group of (20 - 24) years. These finding were agreed with results of the study done by **Igwegbe et al., (2013)** in South-east Nigeria. They studied PCOs: a review of management outcomes in a low resource setting. They found that, the mean age was (27.0 ± 6.7) years with a range of (17 - 45) years. The majority of them (31.1%) were within the age group of (20 - 24) years.

Also the results of the present study showed that, giving birth at advanced maternal age (35 years or more) was more common in women with PCOs group than in the non PCOs group. The result of the present study agreed with the study done by **Roos et al., (2011)** in Sewed. They studied the risk of adverse pregnancy outcomes in women with PCOs: population based cohort study. They found that, giving birth at advanced maternal age was (19.9 %) in the PCOs group Vs (17.6 %) in the non PCOs group respectively with highly significant statistical relationship (p = 0.001).

The present study showed that more than half of the PCOs were primigravida. This finding was agreed with the result of the study done by **Gupta et al., (2009)** in India. They studied pregnancy outcome in women with the PCOs. They found that, (67.8 %) of the PCOs were primigravida.

The present study showed that, most mothers of the PCOs group were nulliparaous. These results were agreed with the results of the study done by **Igwegbe et al., (2013)** in Nigeria. They found that, (75.6 %) were nulliparous. These results revealed the strong association of the syndrome with infertility. Also the results of the present study were agreed with the results of the study done by **Altieri et al., (2010)** in Italy. They found that nulliparous represented (73.3 %), primipara (26.7 %), multipara (0 %) in the PCOs group Vs (61.6 %), (30.2 %) and (8.2 %) in the non PCOs group respectively.

Regarding the BMI the study revealed that, overweight and obesity represents (63.3 %) in the PCOs group and this agree with the worldwide percent which is seen in (50 - 65 %) of PCOs patients, **(Fauser, 2014 and Lodha et al., 2014)**. These results were agreed with the results of the study done by **Igwegbe et al., (2013)** in Nigeria. Their study showed that, BMI of the women in the PCOs group of less than 25 represented (35.6 %), 25 to less than 30 represented (44.4 %) and 30 or more represented (20 %). These results also were agreed with the results of the study done by **Roos et al., (2011)** in Sewed. They found that, BMI of women in the PCOs group of less than 20 represented (4.53 %), 20 to less than 25 represented (34.88 %), 25 toless than 30 represented (28.52 %) and 30 or more represented (32.07 %) Vs (9.9 %), (55.33 %), (24.51 %) and (10.25 %) was seen in the non PCOs group respectively with highly statistical significant relationship (p = 0.001).

The results of the present study also were agreed with the results of the study done by **Anderson et al., (2010)** in Chicago. They studied infants of the women with PCOs have lower cord blood androstenedione and estradiol levels. They found that, normal weight represents (28 %), overweight represents (26 %) and obesity represents (46 %) in the PCOs group Vs (74 %), (7 %) and (19 %) in the non PCOs group with high statistical significant differences among both groups (P = 0.001).

The present study showed that there was a highly significant effect of PCOs on the pregnancy outcomes (P = 0.001). The results of the present study were agreed with the results of the study done by **Roos et al., (2011)** in Sewed. They found that, hypertension represented (0.69 %), GDM (3.3 %), PET (5.84 %) and placenta previa (1.56 %) in the PCOs group Vs (0.28 %), (0.9 %), (2.95 %) and (1.22 %) in the non PCOs group respectively with highly statistical significant relationship (p = 0.001).

Also the results of the present study were agreed with the results of the study done by **Kjerulff et al., (2011)** in the USA. They studied pregnancy outcomes in the women with PCOs: a metaanalysis. They found that GDM represented (14.2 %), hypertension (16.12 %), PET (10.7 %) and preterm delivery (13.45 %) in the PCOs group Vs (5.8 %), (4.25 %), (2.5 %) and (7.28 %) in the non PCOs group respectively with highly statistical significant effect of PCOs on the pregnancy outcomes. Also the present study agreed with the study done by **Foroozanfard et al., (2014)** in Iran. They studied obstetric and neonatal outcome in PCOs with GDM. They found that, PET represented (36.2 %), preterm labor (11.5 %), polyhydrominos (0 %), oligohydrominos (0.8 %) and PIH (27.7 %) in the PCOs group Vs (16.8 %), (15.3 %), (3.1 %), (7.6 %) and (13.7 %) in the non PCOs group respectively.

Also the results of the present study were agreed with the results of the study done by **Altieri et al., (2010)** in Italy. They found that, hypertension represented (13.3%), GDM represented (20 %), PET represented (1.25 %), hypertension and GDM represented (6.7 %) and preterm represented (20 %) in the PCOs group Vs (6.3%), (4 %), (1.3 %), (0 %) and (6.3 %) respectively in the non PCOs group. Also these results were agreed with the results of the study done by **Palomba et al., (2012)** in Italy. They studied the effect of different phenotypes and features on obstetric and neonatal outcomes in women with PCOs. They found that, GDM affect (16.12 %), hypertension affects (14 %) and PET affects in the PCOs group Vs (5.7 %), (4.3 %), (9.7 %) and (1.4 %) in the non PCOs group respectively. These results also were agreed with the results of the study done by **Li et al., (2010)**. They studied metabolic parameters and perinatal outcomes of GM in women with PCOs. They found that PET affects (5.7 %) in the non PCOs group Vs (26.5 %) in the PCOs group.

On the other hand the results of this study were disagreed with the result of the study done by **Gupta et al., (2009)** in India. They found that, there is no significant effect of PCOs on pregnancy outcomes. Hypertension affects (14.2 %) (p = 0.22) and GDM affect (14.2 %) (p = 0.09) in the PCOs group Vs (7.14 %) and (3.57 %) in the non PCOs group.

The present study showed that there is a highly significant effect of PCOs on labor outcomes (p = 0.001). The results of the present study were agreed with the results of the study done by **Roos et al., (2011)** in Sewed. They reported that, preterm in the PCOs group affects (7.84 %) and post term affects (6.69 %) in the PCOs group Vs (4.94 %) and (7.31 %) in the non PCOs group with high significant

statistical relationship (p = 0.001). On the other hand, their results disagree with the result of the present study. PCOs have no significant effect on still birth. It affect (0.45 %) in the PCOs group Vs (0.33 %) in the non PCOs group (p = 0.73).

Regarding the mode of delivery, the results of the present study were agreed with the results of the study done by **Altieri et al., (2010)** in Italy. They found that, SVD represented (46.7 %), OVD represented (0 %) and CS represented (53.3 %) in the PCOs group Vs (64.8 %), (3.8 %) and (31.4 %) in the non PCOs group respectively. Also these results were agreed with the result of the study done by **Foroozanfard et al., (2014)** in Iran. They found that CS represents (79.2 %) in the PCOs Vs (69.5 %) in the non PCOs group.

Also the results of the present study were agreed with the results of the study done by **Roos et al., (2011)** in Sewed. They found that, CS in the PCOs group represented (22.44%) Vs (14.68 %) in the non PCOs group with highly statistical significant relationship (p = 0.001). Also the results of the present study agreed with the results of the study done by **Kjerulff et al., (2011)** in the USA**.** They found that CS affects (33.3 %) in the PCOs group Vs (28 %) in the non PCOs group.

Conclusion

The results of the present study concluded that**,** PCOs had significant effect on the pregnancy outcomes as higher percentage of complications occurred among the PCOs group during pregnancy, labor and the neonates more than those in the non PCOs group.

Recommendations

Based on the results of this study it is recommended that, women who had signs of hyperandrogenism should be screened for PCOs, obese women should reduce their weight to improve circulating androgen, glucose levels, ovulation rates and pregnancy outcomes, once pregnancy had occurred among PCOs women, the women should be followed up for the complications of the syndrome on the pregnancy and neonatal outcomes, educational programs should be done for nurses and physicians to increase their awareness about the syndrome and its consequence, further researches should be done for those women to evaluate their health status during pregnancy and labor.

Summary

women with PCOs are more likely to have menstrual irregularity, hyperandrogenism, nulliparous, had increased BMI, higher rates of ovulation induction, had higher rates of complications during their pregnancy such as early miscarriage, PIH, DM, PET, high multiple pregnancy rate and also they had complications during labor such as preterm labor, post term and CS.

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