

ORIGINAL ARTICLE

Fertility Outcome in Polycystic Patient after Bariatric SurgerySHAH ABBAS¹, NAZIA SAYED², REEMA FATEH³, INAYATULLAH KHAN⁴, MOHAMMAD USMAN⁵¹General and Laparoscopic Surgeon, Assistant Professor Surgery Department, Saidu Group of Teaching Hospital, Swat KPK²WMO Gynae and Obs, Zakir Khan Shaheed Category "C" hospital, Matta Swat KPK³WMO Gynae and Obs, THQ Hospital, Kabal District Swat KPK⁴Senior Registrar General Surgery Department, Saidu Group of Teaching Hospital, Swat KPK⁵Assistant Professor Surgery, Swat Medical College/ Swat Medical Complex Teaching Hospital, Saidu Sharif SwatCorresponding author: Nazia Sayed, Email: drnaziasayed33@gmail.com**ABSTRACT**

Background and Aim: Medically induced weight loss often restores ovulation among polycystic ovarian syndrome (PCOS) women with obesity. Women with PCOS are more likely to be obese and have abdominal fat than women without PCOS, which is the most prevalent metabolic condition in premenopausal women. The present study aimed to determine the fertility outcome in polycystic obese women after bariatric surgery.

Patients and Methods: This cohort study was conducted on 56 polycystic women with obesity undergoing bariatric surgery in the bariatric surgery department of Luqman International Hospital, Saidu Sharif Swat for the duration from 2017 to 2022. Polycystic patients were investigated for main outcome such as live birth rates and pregnancy. SPSS version 26 was used for data analysis.

Results: The live birth rates and pregnancy rates in PCOS women seeking fertility were 83% and 94.8% whereas in control cases were 77.6% and 68.4% respectively. PCOS women took 34 ± 26 months to get pregnant for the first time following surgery, and controls took 31 ± 24 months. There was no significant difference between PCOS neonates and controls in terms of their birth weight means ($2856 + 624$ g vs. $3246 + 592$ g), but the number of newborns with low birth weights was similar between the two groups. Maternal problems (18.4% in PCOS and 23.6% in controls) and newborn complications (24.6% in PCOS and 15.4% in controls) were uncommon, with no differences between groups.

Conclusion: Women with PCOS were more likely to have high fertility rates after bariatric surgery, especially in those seeking fertility, with no difference between those with hyper androgenic PCOS and those without. There were few maternal or neonatal complications such as preeclampsia and gestational diabetes associated with these pregnancies.

Keywords: Bariatric surgery, Polycystic patients, Obesity, Fertility outcome

INTRODUCTION

Obesity may have a clinical influence on female fertility by affecting spontaneous and aided conception rates, miscarriage rates, early labour, stillbirth, and perinatal hazards (hypertension and gestational diabetes). Obesity increases the risk of menstrual irregularity and endometrial disease [1]. Obesity also increases the requirement for surgical delivery and the risk of wound infection and thromboembolic consequences [2]. Excess body fat has been shown to have an effect on the hypothalamic-pituitary-gonadal axis via peripheral and central processes [3]. These hypothalamic-pituitary-ovarian axis disruptions may result in menstruation disorder, anovulation, and infertility [4]. Women with obesity had more irregular and longer menstrual periods, and their levels of luteotropic hormone (LH), estrogen metabolites, follicle-stimulating hormone (FSH), and progesterone in urine were lower [5]. Obesity can cause fetal macrosomia, gestational diabetes, and hypertension during pregnancy [6].

PCOS (polycystic ovarian syndrome) is the most prevalent metabolic condition in premenopausal women [7]. Obesity and abdominal adiposity are usually related with PCOS due to the endogenous hyperinsulinism, excessive ovarian androgen, and insulin resistance [8]. Lately, a randomized control trial revealed that obesity was causative for PCOS, while body mass index variation might not be caused by PCOS [9]. Bariatric surgery patients with obesity have been found to have PCOS in 22% to 50% of cases [10]. Recent meta-analyses and original research have confirmed our earlier findings of PCOS remission following obesity surgery [11]. It is estimated that 96% of PCOS patients resolved the condition after weight loss because serum SHBG increased, menstrual disturbances vanished in almost all women, hirsutism improved significantly, and surrogate indexes of free testosterone (FT) and total testosterone (TT) returned to normal levels [12]. Unfortunately, statistics on pregnancy problems and PCOS women live births rate after bariatric surgery are very rare. Therefore, the present study intended to investigate the fertility outcomes in PCOS after bariatric surgery.

METHODOLOGY

This cohort study was conducted on 56 polycystic obese women undergoing bariatric surgery in the bariatric surgery department of

Luqman International Hospital, Saidu Sharif Swat. The study conducted on all patients underwent bariatric surgery from 2017 to 2022. Polycystic patients were investigated for main outcome such as live birth rates and pregnancy. PCOS diagnosis includes the oligoovulation and clinical hyperandrogenism, and exclusion of congenital hyperplasia, hyperprolactinemia, and androgen-secreting tumors. Women with normal menstrual cycles and no clinical or biochemical hyperandrogenism were considered controls. BMI was computed and anthropometric characteristics were recorded. Blood samples taken were investigated for SHBG, insulin, androstenedione, serum glucose, 17-hydroxyprogesterone and prolactin during amenorrhea early follicular phase and instantly centrifuged for separation of plasma from serum and stored at 20°C till analyzation. The FT concentrations were determined using the amounts of TT, albumin, and SHBG. Conception time and mode and pregnancy associated complication such as preterm birth, diabetes, and hypertensive disorders were secondary outcomes measured. Congenital anomalies, NICU hospitalization, neonatal outcomes such as birth weight (<10th percentile (SGA) and >90th percentile) were secondary outcomes.

RESULTS

The live birth rates and pregnancy rates in PCOS women seeking fertility were 83% and 94.8% whereas in control cases were 77.6% and 68.4% respectively. PCOS women took 34 ± 26 months to get pregnant for the first time following surgery, and controls took 31 ± 24 months. There was no significant difference between PCOS neonates and controls in terms of their birth weight means ($2856 + 624$ g vs. $3246 + 592$ g), but the number of newborns with low birth weights was similar between the two groups. Maternal problems (18.4% in PCOS and 23.6% in controls) and newborn complications (24.6% in PCOS and 15.4% in controls) were uncommon, with no differences between groups. Analytical and clinical findings before and after bariatric surgery are shown in Table-1. Live birth rates and pregnancy outcome before and after bariatric surgery are shown in Figure-1. Pregnancy Outcomes in PCOS Women and control after Bariatric Surgery are shown in Table-II. After Bariatric Surgery, Maternal and neonates

Complications in PCOS and Control Women are shown in Figure-2.

Table-1: Analytical and clinical findings before and after bariatric surgery

Parameters	Before bariatric surgery	After bariatric surgery
Age (years)	30.8 ± 4.2	32.5 ± 7.4
Weight (kg)	114 ± 19	72 ± 12
Body mass index (kg/m ²)	45.2 ± 5.6	27.8 ± 4.2
SHBG (nmol/L)	48 ± 58	88 ± 86
TT (nmol/L)	2.6 ± 0.9	1.4 ± 0.5
Fasting glucose (mmol/l)	5.1 ± 0.8	4.7 ± 0.5
FT (pmol/l)	46 ± 24	22 ± 12
Fasting insulin (pmol/l)	116 ± 81	54 ± 40

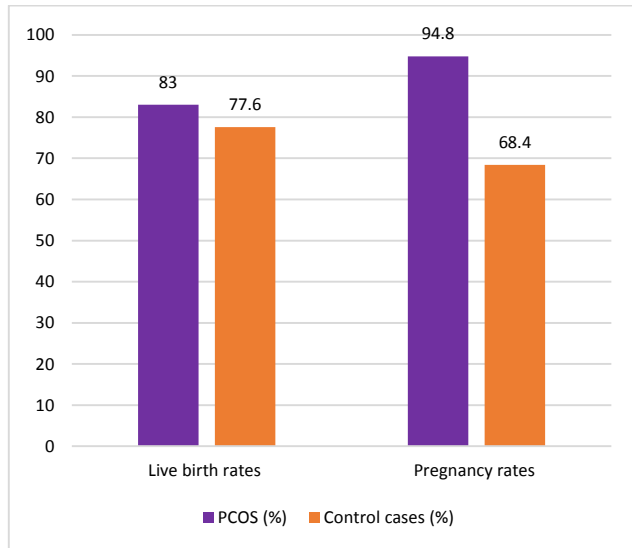


Figure-1: Live birth rates and pregnancy outcome before and after bariatric surgery

Table-2: Pregnancy Outcomes in PCOS Women and control after Bariatric Surgery

Outcomes	PCOS	Control
Time taken for first pregnancy (months)	34 ± 26	31 ± 24
Gestational age (weeks)	38.3 ± 2.9	39.1 ± 2.6
Apgar score	9.3 ± 0.9	9.8 ± 0.6
Birth weight (g)	2856 ± 624	3246 ± 592
Birth height (cm)	46.7 ± 3.9	48.9 ± 4.1

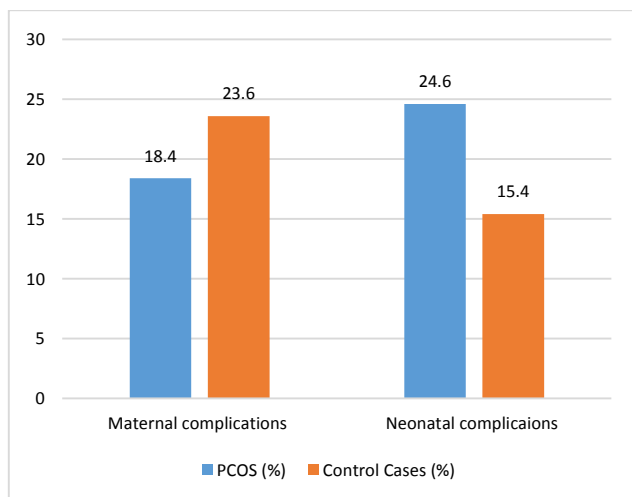


Figure-2: Maternal and neonatal complications in PCOS and control

DISCUSSION

The current study found that conception and pregnancy rates in PCOS women after bariatric surgery were high, mainly those seeking fertility, were comparable to non-hyperandrogenic controls. Both groups of previously extremely obese women did not have maternal or neonatal problems, and PCOS babies had a slightly lower birth weight despite the fact that the proportion of low birth weight neonates was similar to non-hyper androgenic controls. Obesity prior to pregnancy increases the likelihood of unfavorable maternal and perinatal outcomes [13, 14]. Excess body mass during pregnancy may result in difficulties for both mother and child [15]. Obesity combined with pregnancy can lead to birth abnormalities, pre-eclampsia, gestational diabetes, stillbirth, and caesarean sections [16]. In an obese female population, bariatric surgery resulted in significant weight loss and reproductive improvement [17]. Post-bariatric surgery patients had a considerably greater risk of caesarean section [18]. After gastric bypass surgery, reproductive function is characterized by a shorter follicular phase and better female sexual function [19].

Our research previously documented the restoration of PCOS women ovulation and normal menstruation after bariatric surgery [20], which was later confirmed by numerous investigations and meta-analyses [21, 22]. This improvement might be attributed to valuable alterations in insulin sensitivity, incretins, anti-müllerian hormone, and androgens [23]. Nonetheless, it was critical to determine beneficial hormonal and clinical improvements in reproductive results of PCOS patients.

Several modest and retrospective studies have previously investigated fertility outcomes following bariatric surgery in PCOS individuals [24]. Akhter et al [25] investigated the 24 PCOS women after bariatric surgery and found that after undergoing surgery, five previously infertile women conceived without clomiphene whereas the status of infertility of two infertile PCOS women changed after bariatric surgery as reported by Yu et al., [26]. Due to a lack of evidence on pregnancy associated outcomes among PCOS women after bariatric surgery, prescribing therapy is a challenging task in infertile women [27]. Indeed, bariatric surgery is recommended as treatment option for PCOS women infertility management [28]. Our current study showed that conception rates following bariatric surgery are high with minimal maternal and newborn problems, may serve to influence guideline recommendations.

The present study show that PCOS obese women undergoing bariatric surgery might be an effective method of obtaining conception. This is especially significant since, while seeking medical treatment more frequently, obese infertile women account for the smallest proportion obtaining therapeutic or fertility-related surgical amenities [29]. This might be due to the projected greater proportion of unfavorable pregnancy outcomes in this category of women [30].

Maternal and neonatal complications such as gestational diabetes, preterm birth, and hypertension were equally common in PCOS and control groups, following bariatric surgery, there was a rise in pre-eclampsia, retardation of intrauterine development, and gestational age [31]. As a result, bariatric surgery may have a negative impact on pregnancy and neonatal results. Hyperandrogenism in PCOS women has been associated with an increased risk of maternal difficulties but not to poorer newborn outcomes [32]. PCOS women had their baseline elevated androgen concentrations recovered following bariatric surgery, rendering hyperandrogenism unlikely to be the reason of a reduced birth weight.

CONCLUSION

Women with PCOS were more likely to have high fertility rates after bariatric surgery, especially in those seeking fertility, with no difference between those with hyper androgenic PCOS and those without. There were few maternal or neonatal complications such

as preeclampsia and gestational diabetes associated with these pregnancies.

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