

EFFECT OF BARIATRIC SURGERY VERSUS INSULIN SENSITIZERS ON OVULATION IN POLY - CYSTIC OVARY PATIENTS

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INTRODUCTION

Polycystic ovarian syndrome (PCOS), which is thought to afflict 6 to 10% of women globally, is a major contributor to infertility in women of reproductive age. Reduced ovulation frequency, menstruation disruption, and increased androgen are the main reproductive problems associated with this complex endocrine condition. Although the specific cause of PCOS is unknown, it is believed that both insulin resistance and hyperinsulinemia, which causes obesity, are important factors in the disease's pathophysiology. Weight loss is a crucial part of PCOS treatment for obese women. In women with PCOS, even a small weight loss of 5% has been demonstrated to significantly reduce visceral fat mass, improve menstrual function, and trigger spontaneous ovulation. While strict dieting and regular exercise are advised as first-line treatments, these lifestyle changes may not have the same effect on all women. As a result, patients with class 3 obesity have been offered bariatric surgery as a new and effective alternative therapy option for PCOS. While bariatric surgery has been demonstrated to benefit PCOS, its effect on PCOS-related infertility is less apparent.

AIM OF THE WORK

The aim of the work was to evaluate the effect of laparoscopic sleeve gastrectomy versus insulin sensitizers on both resumption of ovulation and insulin resistance within a period of six months in patients with poly cystic ovarian syndrome.

PATIENTS AND METHODS

PATIENTS: Inclusion criteria:

- Age group (20_40 years old).
- Diagnosed as PCOS according to Rotterdam criteria (oligo or an ovulation, hyperandrogenism and 12 follicle measuring 2-9 ml in each ovary by U/S).
- Body mass index more than 35. - Seeking for fertility.
- Normal computer assisted semen analysis (CASA) of their partners .
- Normal hysterosalpingogram.

Exclusion criteria: - Diabetic patients. - Previous history of abdominal or pelvic surgeries.

- History of endometriosis. - Hypothyroidism. - Hyperprolactinemia.

METHODS: This prospective randomized cohort study (Pilot study) was conducted at Alexandria Main University Hospitals, Egypt from February 2022 until February 2023.

Sample size: A total of 20 women were enrolled, after consenting each of them.

Complete history taking of clinical importance including:

Personal history: Age, residence, occupation, marital status and special habits as smoking, alcohol, etc.

Menstrual history: Day of last menstrual period and regularity.

Obstetric history: Gravidity, parity, previous miscarriages or obstetric complications.

Contraceptive history: Type, duration of use before pregnancy.

Medical history: Medical comorbidities as hepatic, renal, endocrinal, psychosocial condition, cardiovascular, diabetes, chronic hypertension.

Surgical history: Previous relevant operations or procedures as office hysteroscopy, etc.

Sexual history: Regularity, associated dyspareunia.

Family history of infertility. **Lifestyle:** dietary habits, exercise.

Clinical examination with special emphasis on: BMI, acne, hirsutism

Investigation: Routine infertility workup investigations as FSL, LH, E2, serum prolactin, TSH, free testosterone, DHEAS, AMH. Baseline transvaginal ultrasound examination

Intervention: This study was a pilot study to assess the feasibility, duration, cost and adverse effects of bariatric surgeries.

The cases were subjected to the following:

Phase 1: collection of sample according to inclusion and exclusion criteria:

Group A: 10 patients who already decided to undergo sleeve gastrectomy (from bariatric surgery clinic) that fulfilled inclusion and exclusion criteria (cases).

Group B: 10 patients from infertility clinic will receive metformin (500mg) three times per day for a period of six months (controls).

Phase 2: After three and six months all patients underwent:

- Detailed history: detailed physical examination. - Three dimentional ultrasound.
- Laboratory investigations: fasting insulin level and HOMA-IR test.

RESULTS

Table 1: Comparison of the two study groups based on ovulation

Ovulation	Bariatric surgery (n = 10)		Metformin (n = 10)		χ^2	FEp
	No.	%	No.	%		
At beginning						
Negative	10	100.0	9	90.0	1.053	1.000
Positive	0	0.0	1	10.0		
After 3 months						
Negative	6	60.0	6	60.0	0.000	1.000
Positive	4	40.0	4	40.0		
After 6 months						
Negative	4	40.0	5	50.0	0.202	1.000
Positive	6	60.0	5	50.0		

χ^2 : Chi square test. FE: Fisher Exact.
p: p value for comparing between the two studied groups.

Table 2: Comparison between the three studied periods according to Fasting insulin in each group

	Fasting insulin			F	p
	At beginning	three months later	six months later		
Bariatric surgery (n = 10)					
Min. – Max.	16.60 – 21.80	11.20 – 16.90	10.10 – 17.10	37.662*	<0.001*
Mean ± SD.	19.23 ± 1.79	14.09 ± 1.79	12.35 ± 2.22		
Median (IQR)	18.85(18.3 – 20.9)	13.80(13.1 – 15.8)	11.60(10.7 – 13.8)		
Sig. bet. periods.	p ₁ =0.001*,p ₂ <0.001*,p ₃ =0.003*				
Metformin (n = 10)					
Min. – Max.	9.40 – 20.20	8.30 – 19.80	6.90 – 18.50	23.971*	<0.001*
Mean ± SD.	15.77 ± 3.96	15.09 ± 4.18	14.15 ± 4.14		
Median (IQR)	16.25(14.0 – 19.5)	15.30(12.5 – 18.7)	14.90(11.8 – 17.6)		
Sig. bet. periods.	p ₁ =0.033*,p ₂ =0.001*,p ₃ =0.003*				

Table 3: Comparison of the two studied groups based on to HOMA-IR

HOMA-IR	Bariatric surgery (n = 10)	Metformin (n = 10)	t	P
At beginning				
Min. – Max.	2.0 – 3.90	2.10 – 3.80	1.112	0.281
Mean ± SD.	3.16 ± 0.60	2.87 ± 0.57		
Median (IQR)	3.25 (2.90 – 3.70)	2.80 (2.40 – 3.10)		
After 3 months				
Min. – Max.	1.60 – 3.10	1.70 – 3.80	0.652	0.523
Mean ± SD.	2.46 ± 0.52	2.63 ± 0.64		
Median (IQR)	2.35 (2.10 – 3.0)	2.60 (2.10 – 3.10)		
After 6 months				
Min. – Max.	1.40 – 3.10	1.50 – 3.40	1.365	0.189
Mean ± SD.	2.0 ± 0.52	2.36 ± 0.65		
Median (IQR)	1.85 (1.60 – 2.30)	2.25 (1.80 – 2.90)		

CONCLUSION

From our study we can conclude that bariatric surgery and insulin sensitizers promote significant weight loss and resumption of ovulation, which is linked to the improvement of Menstrual irregularities, insulin resistance and ovulatory malfunction. Surgery and insulin sensitizers successfully mediate the resolution of PCOS. There was improvement of ovulation, fasting insulin level; HOMA-IR and body mass index and % of weight loss rated 3 and 6 months post treatment in both study groups but with no significant differences between them.