



**Impact of Laparoscopic Ovarian Drilling  
on Ovarian Reserve (serum anti-mullerian  
hormone levels – Antral follicular count, and  
ovarian volume) in patients with anovulatory  
Polycystic Ovarian Syndrome**

Thesis

**Submitted In Partial Fulfillment Of  
Medical Doctorate Degree**

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**2020**

## **SUMMARY**

Polycystic ovary syndrome is one of the most common endocrine disorders in females, it is a major cause of anovulation related subfertility in female.

In PCOS the disturbed hypothalamic-pituitary-ovarian axis is a major supposed factor to be a causative agent, this disturbance referred to tonic LH elevation, hyper androgenic state and consequently anovulation, also impaired function of local ovarian activities make the follicle fail to grow and ovulation will not occur.

Symptoms of PCOS include irregular menstruation, amenorrhea, hirsutism, acne, pelvic pain and subfertility, also diabetes mellitus type2, obesity and CVD are common associated conditions.

Diagnostic criteria for PCOS include two of three of these criteria:

- 1- Clinical and/or biochemical hyperandrogenism.
- 2- Oligomenorrhea / anovulation.
- 3- Poly cystic ovary appearance (PCO) on ultrasound which defined as the presence of 12 or more follicles of 2-9 mm or ovarian volume greater than 10 cm<sup>3</sup>.



Induction of ovulation is the first and most important manner to get successful ovulation in PCOS patient, this induction done mainly by anti estrogen like clomiphene citrate which gives a good result alone or by synergistic effect with Adjuvant therapy like aromatase inhibitors, metformin, and dexamethasone .Also induction of ovulation using gonadotrophins give a good promising result.

laparoscopic ovarian drilling has been well-established as a successful second-line treatment for ovulation induction after failure of clomiphene citrate as it offers several advantages as it is a single treatment leads to repeated physiological ovulatory cycles without the need of repeated courses of medical treatment, long term improvement in menstrual cycles and reproductive performance, lastly avoiding ovarian hyperstimulation and multiple pregnancies which appear with medical induction .

Ovarian reserve represents the reproductive ability of ovary that shows number of follicles in it, where the ovary is the egg bank from which the woman draws during her reproductive life.

Ovarian reserve tests provide an indirect estimate of a woman's remaining follicular pool, many tests can be used especially the following:

- Anti mullerian hormone (AMH).
- Antral follicle count.
- Ovarian volume .
- Basal follicle stimulating hormone (FSH) .
- Inhibin B.



- E2.
- Clomiphene citrate challenging test (CCCT).

Serum AMH is a glycoprotein produced primarily by the granulosa cells from pre-antral and antral follicles. Its main function is the inhibition of primordial follicle growth that is important in dominant follicle selection, usually AMH is 2–4-fold higher in women with PCOS than in healthy women.

Antral follicular count is the number of follicles measuring 2 to 10 mm in greatest diameter. And it represents a good relation suggesting the follicular pool inside the ovary denoting the ovarian reserve. PCOS usually had a high AFC and thus high ovarian reserve.

The ovarian volume is measured by transvaginal ultrasonography and also used as an indicator for ovarian reserve, it is usually high in PCOS.

The exact mechanism of the post-LOD fall in circulating AMH and decreasing AFC remains uncertain. A possible explanation could be a decrease in AMH synthesis due to loss of the primary, pre-antral and small antral follicles, which are the main source of AMH, as a result of thermal damage during LOD. This suggests that any surgical trauma to the ovary is associated with loss of ovarian follicles with subsequent reduction in AMH production.



This study was conducted in Fayoum university hospital outpatient clinic after approval of the research and ethical committee in period from may 2018 to february 2020.

The study included 50 candidate women with clomiphene citrate resistant anovulatory PCOS who attended Fayoum university hospital gynecology outpatient clinic. All candidate women were subjected to informed written consent after explaining the aim of the search for every patient.

The aim of the current study is to investigate the impact of laparoscopic ovarian drilling on ovarian reserve (serum Anti mullerian hormone levels – Antral follicule count and ovarian volume) in patients with anovulatory PCOS.

Measuring AFC, Ovarian volume for all women in this study using transvaginal ultrasonography was done twice<sup>1<sup>st</sup></sup> before laparoscopic ovarian drilling and 2<sup>nd</sup> was 3 months after the procedure.

AMH assessment for all women in this study was done twice 1<sup>st</sup> before laparoscopic ovarian drilling and 2<sup>nd</sup> was 3 months after the procedure.

After statistical analysis of the results, there was significant reduction in AMH from baseline to post-LOD and there was a statistically significantly decrease in AFC from baseline to post-LOD. And this represents normalization of normal levels of AMH



and AFC rather than decreasing in ovarian reserve.

**In conclusion**, we assumed in our study that laparoscopic ovarian drilling is a safety line in treating CC resistant PCOS women and not harmful to ovarian reserve but its affection on AMH, AFC and Ovarian volume is a normalization of their values rather than a harmful reduction of the ovarian reserve.