

Laparoscopic Ovarian Drilling in Women with Anovulatory Infertility

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ABSTRACT

Background: Polycystic ovaries are common condition mostly found in reproductive aged women. Conventionally clomiphene is used instead of letrozole as first line drug in patients presenting with infertility as later is off label. 20% women are clomiphene resistant, those can be treated with gonadotrophins, other ovulation induction drugs or laparoscopic ovarian drilling. **Objective:** As PCOS is one of the leading cause of anovulatory infertility among women of reproductive age group. We study different factors to speculate the effect of laparoscopic ovarian drilling. **Study Design:** Quasi experimental study. **Setting:** Department of Gynecology & Obstetrics, Faisalabad Medical University, Faisalabad Pakistan. **Duration:** One year from August 2021 to August 2022. **Methods:** Our study includes 100 anovulatory PCOS patients resistant to conceive by medical treatment like clomiphene, later selected for LOD. Various clinical and biochemical parameters of PCOS were examined. Outcome was measured between different categories by using SPSS V 25 system. **Results:** Polycystic anovulatory women with BMI >35kg/m², serum testosterone concentration > 4.5 and span of infertility > 3 years showed lack of response to LOD. Whereas response was seen in patients with less BMI and testosterone concentration along with decrease span of infertility. **Conclusion:** Ovarian drilling by laparoscopy is an efficient second choice for infertile anovulatory patients resistant to clomiphene citrate, main benefits are single time treatment, as opposed to several trials of ovulation induction, cost effective and a method to replace gonadotrophins effectively for ovulation induction while maintaining pregnancy rate.

Keywords: Anovulatory infertility, Polycystic ovarian syndrome (PCOs), Laparoscopic ovarian drilling (LOD), Clomiphene Citrate (CC).

INTRODUCTION

Polycystic ovarian syndrome is an endocrine disorder affecting 10-15% of woman.¹ It is usually caused by disparity of reproductive hormones, causing oligomenorrhoea, weight gain, hirsutism and abnormal ovarian morphology.^{2,3} Ovarian wedge resection was performed for the first time in 1935 to treat PCOS². Later procedure didn't gain popularity due to adhesion formation. Ovarian drilling also known as ovarian diathermy was performed in 1984 for the first time in Norway by Gjonnaess H.⁴ He achieved ovulation rate of 45 % and pregnancy rate of 42%. In 1988 laparoscopic punch resection of ovaries done in Japan successfully.⁵ In 1989 ovarian diathermy was conducted with argon, carbon dioxide (CO₂) or potassium titanyl phosphate (KTP) laser vaporization.⁶ Hence ovarian diathermy was finally use in its modified form for the purpose of spontaneous ovulation in PCOS women. First pregnancy

was reported in France after ovarian diathermy about 30 years ago.⁷ Prevalent cause of anovulatory infertility in 75% of cases turn out to be PCOS,⁸ LOD is considered as second line treatment in such cases. Multiple authors reported increased rate of ovulation (80%) and better outcome in pregnancy (60%) after LOD⁹. Treatment options in such patients are weight reduction, insulin sensitizer, ovulation inducing agents and ovarian drilling. LOD works by reducing Serum androgen and inhibin level with the destruction of ovarian stroma along with decrease chances of multiple pregnancy. Whereas with gonadotrophins and clomiphene citrate there are increased chances of ovarian hyperstimulation (OHSS) and multiple pregnancies.^{10,11}

Purpose of this study is to ascertain clinical and hormonal parameters of ovarian diathermy in clomiphene resistant patients with PCOS.

METHODS

Between August 2021 to August 2021, 100 patients with anovulatory infertility due to PCOS were selected for ovarian drilling at Faisalabad Medical University, Faisalabad. Women with PCOS (on the basis of Rotterdam criteria) having anovulatory infertility for > 2 years duration were selected. These patients were found resistant to CC previously taken at least for 3- 4 cycles.

Surgical technique used 3 port sites, 12mm port entered just above umbilicus, 10mm port on the operator side and a 5mm port on opposite side of operator, in iliac fossa respectively. 7-8mm long diathermy needle used for ovarian drilling. Valley lab cautery was used. Monopolar coagulating current at 30w was used and span of each penetration was 3-4 second. 4-5 punctures were made in each ovary. 300 ml saline was introduced in the peritoneal cavity after the procedure, to nullify heat effect on the ovaries. Post operatively patients remained well and discharged on the next day and were followed for one year for improvement in biochemical parameters, resumption of ovulation and rate of conception. 100

patients were included by taking 47.1%¹² prevalence of pregnancy after LOD, confidence level = 95% and absolute precision = 10%. Patients were selected by Quasi experimental study, data was entered by SPSS V-25 system, nonprobability consecutive sampling used, chi square test was applied.

RESULTS

100 patients underwent LOD for PCOS related anovulatory infertility. Out of these 100 patients 60% ovulated spontaneously after ovarian drilling, only 15 % required additional use of clomiphene citrate. Total patients ovulated in the study were 75 out of 100 (75%). The results showed that patients above 35 years of age, BMI more than 30, subfertility more than 3 to 5 years and increased androgen level lead to decreased ovulation & pregnancy rate, as depicted in Table-I. Only two cases of multiple pregnancies were reported.

Patients characteristics including age, BMI, duration of infertility, LH/FSH ratio, serum testosterone and serum LH were recorded. Comparison analysis between groups done. P value < 0.05 was taken as significant.

Table 1: The characteristics of 100 PCOS women who underwent LOD with anovulatory infertility

Characteristics	Category	n	Frequency of Ovulation rate		P-Value	Frequency of Pregnancy rate		P-Value
			Yes	No		Yes	No	
Age (Year)	< 35	80	60	20	0.003	35	25	0.265
	> 35	20	8	12		3	5	
BMI (Kg/m ²)	< 25	70	57	13	0.0001	40	17	0.031
	25-30	22	10	12		4	6	
	> 30	8	2	6		0	2	
Duration of infertility (year)	< 2	65	58	7	0.0001	42	16	0.032
	2-3 year	20	10	10		5	5	
	3-5	15	5	10		1	4	
Serum LH/FSH	> 2	21	16	5	0.382	7	9	0.333
	2-3.9	62	50	12		31	19	
	≥ 4	17	11	6		5	6	
Serum LH(IU/L)	< 10	22	17	5	0.589	10	7	0.35
	10-19.9	62	50	12		30	20	
	> 20	16	11	5		4	7	
Serum Testosterone (nmol/L)	< 2.5	44	38	6	0.0001	22	16	0.15
	2.5-4.5	38	30	8		13	17	
	> 4.5	18	6	12		1	5	

DISCUSSION

PCOS is the prevalent cause of anovulatory infertility, latest guideline by WHO also address this issue.¹³ LOD may be considered as a secondary treatment in CC resistant PCOS¹⁴ patients, it can be done in patients otherwise undergoing diagnostic laparoscopy for infertility. LOD is mostly preferred as 1st choice by those non affording couples presenting in tertiary care hospitals in country like ours (as treatment is free of cost by govt), patients don't have to buy expensive ovulation

induction drugs and don't need regular follow ups which is difficult for patients belonging from peripheries.

We studied effect of ovarian drilling on hormonal and clinical parameters. Women who fail to conceive after 3 or 4 cycles of CC presented were selected and treated by LOD. Factors like raised BMI, raised testosterone level and increased duration of infertility showed poor results with LOD in our study. Patients > 35 years of age group were small in number and therefore we were unable to determine their impact in this study. LH level fails to

show any statistical significance in conception rate. Our findings correlate with the study by Gjonnaess H¹⁵ in which there was higher likelihood of success in patients with < 3 years of infertility. Unilateral ovarian drilling also done in some studies and was equally found effective as compared to bilateral ovarian drilling.¹⁶ Randomized trials by Abu Hashim H et al showed no significant difference in ovulation, miscarriage, live birth or clinical pregnancy rate when unilateral was compared with bilateral ovarian drilling.¹⁷

In some studies, results of LOD are comparable to clomiphene. A meta-analysis, reported no difference in effectiveness and safety between metformin versus LOD with or without CC in patients with anovulatory PCOS.¹⁸ An updated review contradicting our study showed that LOD may decrease live birth rate when compared with other ovulation induction methods.¹⁹ Similarly another study showed significantly lower birth rate with LOD when compared with letrozole instead of CC.²⁰ ACOG (American College of Obstetricians & Gynaecologist) do not define clearly the role of surgical treatment for PCOS patients.²¹

CONCLUSION

Laparoscopic ovarian drilling is not the first choice in PCOS women but have role in CC resistant patients. Risk of multiple pregnancy and other side effects of hormonal therapy such as OHSS (Ovarian hyperstimulation syndrome) and multiple pregnancy are also avoided as depicted by our study.

LIMITATIONS:

Our study include data from single institution with limited sample size.

SUGGESTION & RECOMMENDATIONS:

More studies required to further compare effect of LOD alone or followed by ovulation induction in PCOS patients.

CONFLICT OF INTEREST / DISCLOSURE:

None.

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