Original Research Article

Indian Journal of Obstetrics and Gynecology
Volume 7 Number 3 (Part - II), July - September 2019
DOI: http://dx.doi.org/10.21088/ijog.2321.1636.7319.17

Laparoscopic Ovarian Drilling in Clomiphene Citrate Resistant Cases of Polycystic Ovarian Syndrome

Banothu Saroja

How to cite this article:
Banothu Saroja. Laparoscopic Ovarian Drilling in Clomiphene Citrate Resistant Cases of Polycystic Ovarian Syndrome. Indian J Obstet Gynecol. 2019;7(3):471–474.

[1]Assistant Professor, Department of Obstetrics and Gynaecology, Deccan Medical college, Hyderabad, Telangana 500058, India.

Corresponding Author: Banothu Saroja, Assistant Professor, Department of Obstetrics and Gynaecology, Deccan Medical college, Hyderabad, Telangana 500058, India.

E-mail: drsaroja9247@gmail.com

Received on 03.08.2019; **Accepted on** 18.09.2019

Abstract

Background: Instead of gonadotropins, laparoscopic ovarian drilling is considered an alternative method to induce ovulation in polycystic ovary syndrome.

Aim: This study is a prospective study to compare the efficacy of ULOD versus BLOD in clomiphene citrate resistant patients in terms of ovulation and pregnancy rates.

Materials and Methods: This study was a prospective, parallel randomised clinical trial which was conducted between May 2010 to June 2011. 110 PCOS patients with CC resistance were allocated randomly into ULOD (Group I) and BLOD (Group II**)**

Results: A total of 110 patients with PCOS who underwent LOD were included. These patients were divided equally in two groups of ULOD and BLOD. Between two groups, baseline characteristics difference of patients prior to laparoscopy were not significant (p>0.05). No significant differences were observed in clinical and biochemical responses also. In both groups, after drilling, LH and testosterone levels mean serum concentrations were decreased. Between two groups, the mean decrease in serum LH and testosterone concentrations levels were not statistically significant.

Conclusion: In ovulation and pregnancy rates, ULOD seems to be equally efficient as BLOD.

Keywords: Laparoscopic Ovarian Drilling; Clomiphene Citrate; Polycystic Ovarian Syndrome.

Introduction

Polycystic Ovarian Syndrome (PCOS) was the most common cause of anovulatory infertility.[1] The first line of treatment in these patients is induction of ovulation with clomiphene citrate. The failure to ovulate after receiving a maximum dosage of 150 mg per day for five days beginning of third day of menstrual cycle is defined as clomiphene citrate resistant.[2–4] To induce ovulation in these patients, instead of gonadotropins, an alternative method known as laparoscopic ovarian drilling (LOD) was performed. LOD has more benefits, despite minimal morbidity associated with the method. Elimination of cycles monitoring, decreasing the risk of ovarian hyperstimulation syndrome (OHSS) multifetal pregnancy, spontaneous ovulation are the benefits of the method.[5–7] Risk of premature ovarian failure and tubo-ovarian adhesion are the disadvantages of laparoscopic ovarian drilling. Risk for TOA and POF is significantly decreased by reducing the potential damage to ovarian surface epithelium. Studies compared the unilateral LOD (ULOD) and bilateral LOD (BLOD) and concluded that ULOD is equally efficacious as BLOD in inducing ovulation and achieving pregnancy besides minimizing the risk of adhesion and POF. This study is a prospective study to compare the

efficacy of ULOD versus BLOD in clomiphene citrate resistant patients in terms of ovulation and pregnancy rates.

Materials and Methods

This study was a prospective, parallel randomised clinical trail which was conducted in Deccan Medical College, Hyderabad. This study was conducted between May 2010 to June 2011. Out of 152 patients with clomiphene citrate resistant PCOS were initially examined. 10 patients had other endocrine abnormalities, eight patients had mechanical factors abnormally such as unilateral or bilateral tubal blockages in hysteroscopy. Eight patients had concomitant male infertility and 4 patients refused to participate in the study.

One hundred twenty (120) patients were included in the study. Out of 120 patients with PCOS with CC resistant ovaries, 60 patients underwent ULOD and 60 patients underwent BLOD. Out of 60 patients who underwent ULOD, 2 patients with tubal disease underwent laparoscopy, 3 patients with missed follow up visit were excluded from study. Out of 60 patients who underwent BLOD, 2 patients with tubal disease underwent laparoscopy, 3 patients with missed follow up visit were excluded from study.

One hundred ten (110) PCOS patients with CC resistance were allocated randomly into

ULOD (Group I) and BLOD (Group II).

Electrocauterization was performed on right ovary in group I and in both ovaries in Group II. As ovulation occurs frequently in the right ovary, the right ovary was selected in ULOD group, i.e. 55% of the time when compared to left ovary, and oocytes from the right ovary have higher potential for pregnancy. The probability of adhesion is more in left ovary than right one. Using unipolar diathermy needle, after establishing tubal patency with methylene blue, LOD was performed.

The penetration was about in depth of 8 mm, a setting of 60W, and 5 points per ovary. For adhesion prevention, the ovaries were cooled by normal saline immediately after cauterization and about 300–500 mL of normal saline was left in pelvic cavity. In complicated cases during surgery such as anaesthetic problems or organs injury, the operation was discontinued and cases were dropped out of study. The variables such as age, infertility duration, cycle characteristics, body mass index (BMI), follicle stimulating hormone (FSH), luteinizing hormone, and testosterone level on day 3 of spontaneous or induced menstruation were assessed before and after laparoscopy.

The women were asked to start keeping a menstrual calendar the day after laparoscopy. Within 6 weeks after LOD, if the patient started a menstrual period, a blood sample was collected for measuring LH, FSH and testosterone levels after 2–3 days of menstrual cycle. Within 6 weeks after LOD, if menstruation didn't start spontaneously, an intramuscular injection (100 mg progesterone) was given. Hormonal measurements were done after excluding pregnancy after 2–3 of menstrual cycle. On Day 21, assessment of ovulation was done by measuring progesterone in patients who had spontaneous menstruation. Ovulation means progesterone level greater than 3 ng/mL. By assessing progesterone level, if there was no ovulation, the patients were advised to use CC with a starting dose of 50 mg/day–150 mg/day from 3–7 days that was monitored by ultrasound. Until patients conceived, they were followed up. In the present study, after detecting fetel heart on transvaginal ultrasound, pregnancy was defined.

Statistical analysis was done by descriptive and analytic statistics. Data was analysed by using SPSS software. Data was described as mean and standard deviation for numeric variables while it was shown as number and percentage for categorical variables. Independent t test was used to compare mean values between two groups, while paired t test was used to compare mean values of FSH, LH and testosterone levels before and after LOD. A *p*-value less than 0.05 was considered significant.

Results

In the study, a total of 110 patients with PCOS who underwent LOD were included. These patients were divided equally in two groups of ULOD and BLOD. Among 55 patients in Group I who were undergoing ULOD, 2 patients were excluded due to tubal disease which was diagnosed during laparoscopy and 3 patients were excluded due to missing follow up visit. Among 55 patients in Group I who were undergoing BLOD, 1 patient was excluded due to endometriosis which was diagnosed during laparoscopy and 4 patients were excluded due to missing follow up visit. 50 patients in each group were included in the study (Tables 1–4).

Table 1: Baseline characteristics of 100 CC resistant PCOS patients prior to laparoscopy.

Clinical Screening Parameter	Group I	Group II	*p*-value
Mean Age (years)	28.20 ± 3.59	29.14 ± 4.12	0.622
Mean of infertility duration (Y)	3.01 ± 2.14	4.28 ± 2.37	0.062
Mean of menarche (Y)	12.87 ± 1.47	12.48 ± 1.98	0.658
BMI (%) >30	32.8%	47.1%	0.214
BMI (%) ≤30	64.9%	51.7%	–

Table 2: Baseline characteristics of 100 CC resistant PCOS patients prior to laparoscopy.

Cycle history Screening Parameter	Group I	Group II	*p*-value
Amenorrhea	19%	13.1%	0.528
Oligomenorrhea	81%	85.9%	–
Endocrinologic mean	**Group I**	**Group II**	***p*-value**
LH (IU/L)	11.0 ± 0.4	11.2 ± 1.3	0.600
FSH (IU/L)	5.5 ± 1.4	5.6 ± 2.1	0.835
Testosterone (pg/mL)	1.5 ± 0.6	1.7 ± 1.2	0.444

Table 3: Clinical response on ovulation and pregnancy rates.

Menstrual Resumption	Group I	Group II	*p*-value
Spontaneous	33 (66%)	35 (70%)	0.814
Induced	15 (30%)	17 (34%)	–
Ovulation Rate	**Group I**	**Group II**	***p*-value**
Spontaneous	25 (50%)	27 (54%)	0.841
Induced	10 (20%)	10 (20%)	0.729
Pregnancy rate	16 (32%)	19 (38%)	0.317

Table 4: Comparison between mean serum levels of FSH, LH and testosterone levels before and after LOD.

Mean Serum Level	Before LOD	After LOD	*p*-value
FSH (IU/L) Unilateral	5.5 ± 1.4	5.5 ± 2.4	0.953
FSH (IU/L) Bilateral	5.9 ± 2.1	6.4 ± 2.8	0.548
T test *p*-value	0.857	0.741	
LH (IU/L) Unilateral	11.5 ± 0.7	6.4 ± 3.8	<0.001
LH (IU/L) Bilateral	11.8 ± 1.1	8 ± 2.6	<0.001
T test *p*-value	0.588	0.311	
Testosterone (pg/mL) Unilateral	1.6 ± 0.4	1.3 ± 0.70	0.001
Testosterone (pg/mL) Bilateral	1.8 ± 1.4	1.6 ± 1.9	0.001
T test *p*-value	0.417	0.069	

Discussion

In this study, it was found that between the groups, there were no significant differences in terms of ovulation and pregnancy rates. In this study, the effect of ULOD and BLOD on the ovulation and pregnancy rates were evaluated in 100 CC resistant PCOS patients. Abdelhafeez MA *et al.*[8] conducted a study in which 60 women were selected, and randomly divided into two groups, unilateral versus bilateral ovarian drilling. Regarding regularity of menses within 3 months following LOD, this study was similar to present study in there was no significant difference between women of both groups. In each group, individually, there was a significant rise in basal serum FSH, a significant reduction in basal serum LH and a significant rise in midluteal serum progesterone when 3 month post-LOD levels were compared to pre-LOD levels. These significant changes were comparable in both groups. Poonam Laul *et al.*[9] study was also similar to the present study in postovarian drilling it was seen that no major differences were noted

between the two groups in return of spontaneous menstruation at 6 weeks (65% vs 60%), overall ovulation rate (55% vs 65%) and pregnancy rate (45% vs 40%). The mean fall in serum LH, serum FSH and serum testosterone were also similar in the two groups. Roy KK *et al.*[10] study also showed similar results such as there was no statistical difference between the two groups in terms of clinical and biochemical response, ovulation rate and pregnancy rate. Postoperatively, tubo-ovarian adhesions could be assessed in 36.3% of the patients and no adhesions were found in a single case in either group. In Ziba Zahiri Sorouri *et al.*[11] study; similar results were seen such as Differences in baseline characteristics of patients between two groups prior to laparoscopy were not significant (p>0.05). There were no significant differences between the two groups in terms of clinical and biochemical responses, spontaneous menstruation (66.1 vs. 71.1%), spontaneous ovulation rate (60 vs. 64.4%), and pregnancy rate (33.1 vs. 40%) (p>0.05). Following drilling, there was a significant decrease in mean serum concentrations of luteinizing hormone (LH) (p=0.001) and testosterone (p=0.001) in both the groups. Mean decrease in serum LH (p=0.322) and testosterone concentrations (p=0.079) were not statistically significant between two groups. Mean serum level of follicle stimulating hormone (FSH) did not change significantly in two groups after LOD (p>0.05). Flyckt RL *et al.*[12] conducted a study in which they have shown that ovulation and pregnancy rates are comparable between ovulation induction with gonadotropins and LOD, but LOD avoids the risks of multiple pregnancy and ovarian hyperstimulation syndrome. LOD is also more cost effective and better tolerated than gonadotropin therapy.

Conclusion

In ovulation and pregnancy rates, ULOD seems to be equally efficient as BLOD.

References

1. Abu Hashim H, Al-Inany H, De Vos M, *et al.* Three decades after Gjönnaess's laparoscopic ovarian drilling for treatment of PCOS; what do we know? An evidence-based approach. Arch Gynecol Obstet. 2013; 288(2): 409–422.
2. Costello MF, Misso ML, Wong J, *et al.* The treatment of infertility in polycystic ovary syndrome: a brief update. Aust N Z J Obstet Gynae-col. 2012;52(4):400–03.
3. Hull MG. Epidemiology of infertility and polycystic ovar- ian: endocrinological and demographic studies. Gynecol Endocrinol. 1987;1(3):235–45.
4. Adam J, Polson DW, Franks S. Prevalence of polycystic ova-ries in women with anovulation and idiopathic hirsutism. Br Med J (Clin Res Ed). 1986;293(6543):355–59.
5. Zolghadri J, Motazedian S, Dehbashi S, Tavana Z. Lapa- roscopic ovarian drilling inclomiphene resistant pco pa-tients: a preferred method of treatment. Med J Islam Re-pub Iran. 2005;19(3): 237–40.
6. Legro RS, Barnhart HX, Schlaff WD, *et al.* Clomiphene, metformin, or both for infertility in the polycystic ovary syndrome. N Engl J Med. 2007;356(6):551–66.
7. Moll E, Bossuyt PM, Korevaar JC, *et al.* Effect of clomifene citrate plus metformin and clomifene citrate plus placebo on induction of ovulation in women with newly diagnosed polycystic ovary syn- drome: randomised double blind clinical trial. BMJ. 2006;332(7556):1485.
8. Abdelhafeez MA, Ali MS, Sayed SN. Unilateral versus bilateral laparoscopic ovarian drilling in clomiphene citrate resistant poly- cystic ovary syndrome. Life Sci J. 2013;10(1):3057–60.
9. Laul P, Saxena P, Kurrey S, *et al.* Clinical outcome of unilateral versus bilateral laparoscopic ovarian drilling in clomiphene citrate resistant cases of polycystic ovarian syndrome: a comparative study. 2018;7(3):991–95.
10. Roy KK, Baruah J, Moda N, Kumar S. Evaluation of unilateral versus bilateral ovarian drilling in clomiphene citrate resistant cases of polycystic ovarian syndrome. Arch Gynecol Obstet., 2009, Oct;280(4):573–8.
11. Sorouri ZZ, SSharami SH, Tahersima Z, *et al.* Comparison between Unilateral and Bilateral Ovarian Drilling in Clomiphene Citrate Resistance Polycystic Ovary Syndrome Patients: A Randomized Clinical Trial of Efficacy. Int J Fertil Steril. 2015 Apr-Jun;9(1):9-16.
12. Flyckt RL, Goldberg JM. Laparoscopic ovarian drilling for clomiphene-resistant polycystic ovary syndrome. Semin Reprod Med. 2011; 29(2):138–46.