

**For infertile PCOS women who are not responding to oral ovulation-inducing medications,
laparoscopic ovarian drilling**

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ABSTRACT

Background: Gonadotrophin therapy is expensive, time-consuming, and linked to hyperstimulation and multiple pregnancies in infertile people with polycystic ovarian syndrome (PCOS) who are resistant to ovulation induction medications. The objective was to ascertain the pregnancy rate after laparoscopic ovarian drilling (LOD) in instances with infertile PCOS that were refractory to oral ovulation-inducing medications. Setting and Design: Patients with general gynaecological issues from various socioeconomic backgrounds were treated in a tertiary care facility without access to assisted reproductive technologies (ART). Women who were resistant to oral ovulation induction medications participated in this prospective observational trial. research Period: The research was conducted between 2008 and 2012. Materials and Methods: 48 patients with infertile PCOS that failed to conceive following three or more cycles of letrozole, metformin, and clomiphene citrate (CC)/CC. Electrical diathermy was used to perform LOD. Findings: 66% of women became pregnant overall. 11% in the second cycle, 6% in the third cycle, and 13% in the same cycle. 10% of pregnancies ended in spontaneous abortion, while 90% of babies were born alive. In conclusion, 66% of patients with oral medication-resistant PCOS were able to conceive after ovarian drilling.

Keywords: Laparoscopic ovarian drilling (LOD), polycystic ovarian syndrome (PCOS), pregnancy rate, resistance

INTRODUCTION

The first-line medication for inducing ovulation in women with infertile polycystic ovarian syndrome (PCOS) is clomiphene citrate (CC). While the pregnancy rate with CC is just 20–40%, the ovulatory rate is 70–80%.[1] At three months, the cumulative conception rates with incremental dosages are 50%, 45%, and 33% with 50 mg, 100 mg, and 150 mg; at six months, they are 62%, 66%, and 38%.[2] As a result, even after six cycles, a significant percentage of women are unable to conceive. Ovulation and oocyte quality may be impacted by an elevated intraovarian androgen environment. Tenacious cervical mucus and unfavourable endometrium may be reached at dasaripapa@gmail.com. Different writers have identified PCOS resistant to CC in different ways, and there is inconsistency when it comes to resistance or failure to ovulation induction medications. A dosage of 150 mg or 200 mg, which prevents pregnancy and/or ovulation, is considered by some writers, while three cycles of increasing doses of CC are considered by others.[3] When CC is unable to facilitate pregnancy, other ovulation induction medications including letrozole and metformin are also used. Infertile women who have undergone ovulation induction with different ovulogens come to our institute to seek more guidance. Gonadotropins with or without intrauterine insemination (IUI), ovarian drilling, and in vitro fertilisation (IVF) are possibilities for those who are unsuccessful with oral ovulation medications. Gonadotropin therapy is expensive, time-consuming, and The Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which permits others to remix, modify, and expand upon the work non-commercially as long as the author is given credit and the new works are licensed under the same conditions, governs this open access article.

Setting and design

The setting was a tertiary care facility that served patients from various socioeconomic backgrounds with general gynaecological issues but lacked capabilities for assisted reproductive technologies (ART). Women who were resistant to oral ovulation induction medications participated in this prospective observational trial. The research was conducted between 2008 and 2012.

MATERIALS AND METHODS

48 instances with infertile PCOS (as defined by the Rotterdam criteria) that failed to conceive following three or more cycles of leterozole, metformin, and CC/CC. Every woman had an endocrine screening. Follicle-stimulating hormone (FSH), luteinizing hormone (LH), testosterone, and prolactin levels were measured on day two, along with the thyroid profile and glucose tolerance test (GTT). Cases with hyperandrogenic PCOS (hyperandrogenemia) were treated with six cycles of Krimson 35, and when their blood testosterone levels were normal, they were given ovulation induction with CC. Those who did not conceive after three cycles were enrolled for LOD. In a same vein, diabetes and hypothyroidism were treated and recruited when the results were within normal ranges. Under general anaesthesia, LOD was performed as an outpatient surgery. The three-port method was applied. Following the stabilisation of the ovary using a nontoothed forceps (Maryland), four to five punctures were done with an 8 mm long and 2 mm diameter drilling needle utilising a 40 watt monopolar current. Cauterisation lasted 10 seconds, as opposed to the 4-5 seconds reported in earlier research. Following chromotubation, 500 mL of regular saline was used for saline irrigation. The author (single investigator) administered a single dosage of ceftriaxone to each woman. They were instructed to live together as usual and come back in three months if they were not pregnant. After three months, ovulation induction was started with 150 mg of CC and 500 mg of metformin three times a day. After three and six months, the pregnancy rate was determined. Metformin was used continuously during pregnancy by those who became pregnant using both CC and metformin. Metformin was used by all pregnant women with type 2 diabetic mellitus (T2DM).

RESULTS

Due to their remote locations, three of the 48 women who were recruited were lost for follow-up. They were thus left out. Table 1 displays the women's clinical profile. The average age was 28 years, and the average length of infertility was 4.3 years (range 2–10 years). Four percent had hyperprolactinemia and eight percent had hyperandrogenism. Four percent had type 2 diabetes, while six percent had hypothyroidism. Six percent had both T2DM and hypothyroidism. The result is shown in Table 2. The pregnancy rate at three months was 30.7%, with 13% of pregnancies occurring during the same period, 11% during the subsequent cycle, and 6.7% during the third cycle. Metformin and CC were used to induce ovulation in 35.5% of cases after three months and within six months. 90% of pregnancies ended in live births, while 10% had early pregnancy loss. During the surgery, two patients had ovarian ligament bleeding, and one of them required a laparotomy to stop the bleeding because of technical issues. The lady who had a laparotomy became pregnant in the third month and gave birth normally.

DISCUSSION

Nonresponse to CC is a prevalent issue in practice, with reported rates ranging from 15% to 40%. Surgery or medicine may be used to address CC resistance. Depending on the clinical conditions and preferences of women, the NICE guideline for CC-resistant PCOS recommends either LOD or combination treatment with CC plus metformin or gonadotropin therapy.[5] Metformin medication and ovarian drilling were evaluated in a prospective trial by Malkawi et al. in CC-resistant infertile PCOS women. The study found no significant difference in ovulatory rate or pregnancy rates, hence patients with CC resistance might be provided either of these treatments. Metformin and ovarian drilling had conception rates of 64.1% and 59.8%, respectively [1]. When metformin and CC were used together to treat CC-resistant infertile PCOS in our group, the pregnancy rates were significantly lower.[6] Consequently, an alternate treatment was required.

35 CC-resistant infertile PCOS women were randomly assigned by Kaya et al. to undergo laparoscopic multineedle intervention, ovulation induction with gonadotropins, and IUI. The pregnancy rate in this trial was low, and there was no discernible difference between the two groups (35.3% vs. 33.3%).[3] The cumulative conception rate at 6 to 12 months following ovarian drilling is equivalent to three to six cycles of gonadotropin therapy, with the benefits of a lower incidence of OHSS and multiple pregnancies, according to a 2010 Cochrane review that examined five eligible randomised controlled trials (RCTs).

Table 1: Clinical profile

Characteristic	Number (%) N = 45
Mean age in years	28
Mean duration of infertility	4.3 years

Hyperandrogenic PCOS	4 (8%)
Hyperprolactinemia	2 (4%)
Hypothyroidism	3 (6%)
T2DM	2 (4%)
Hypothyroidism and T2DM	3 (6%)

Table 2: Conception after ovarian drilling
Duration to conception Pregnancy (%) rate

≤3 months	14 (30.7)
Same cycle	6 (13)
Second cycle	5 (11)
Third cycle	3 (6.7)
>3 to 6 months (metformin and CC)	16 (35.5)
6 months	6

Reduced ovarian reserve, which is harmful to infertile women, is the theoretical issue with diathermy of the ovaries. Women with PCOS have a two- to three-fold rise in anti-Müllerian hormone (AMH), a measure of ovarian reserve. Serum AMH levels before and after LOD were measured in a research to address the problem of reduced ovarian reserve after ovarian diathermy. The odds of becoming pregnant decreased over the cutoff level of AMH, which was 7.7 ng/mL. The median plasma AMH level dramatically dropped to 4.6 ng/mL ($P = 0.003$) at LOD and remained low after three and six months of follow-up. Pretreatment AMH levels were considerably lower in women who ovulated after LOD than in those who did not. With a sensitivity of 78% and specificity of 76%, AMH was shown to be an excellent predictor of no ovulation after LOD. The follicle destruction caused by LOD may not have been enough to lower intraovarian AMH levels in women who did not ovulate after LOD since their pretreatment AMH readings were high.[14]

Table 3 displays the pregnancy rate and outcome reported by other authors as well as the current research. Although the pregnancy rate was more than 50% in every study, the quantity of heat energy utilised and the follow-up differed. In 1998, it was observed that women with PCOS and anovulatory infertility had a 55% pregnancy rate and a 6% miscarriage rate [15]. A pregnancy rate of 54.5% was found in the follow-up of women who had laparoscopic ovarian diathermy at All India Institute of Medical Sciences (AIIMS) for four to five years.[16] The prognosis of ovarian drilling was influenced by high LH levels, the length of infertility, and previous tubal pathology.[15, 16] The first-line treatment for PCOS infertility is six cycles of CC with or without metformin; the second-line treatment is laparoscopic ovarian surgery or gonadotropin stimulation; and the third-line treatment is IVF, according to the agreement.[17] For women with CC-resistant PCOS, an economic analysis of laparoscopic ovarian diathermy vs gonadotropin treatment found that ovarian drilling had lower direct and indirect expenses (20% lower), along with the benefit of fewer multiple pregnancies.[18] The function of LOD as an alternative treatment for young PCOS women with elevated LH levels, those who need laparoscopic evaluation, those who cannot follow up with rigorous monitoring, noncompliance, and those who have an excessive reaction to gonadotropins was covered in a recent big study.[19]

CONCLUSION

Since more than 50% of CC-resistant PCOS patients became pregnant after LOD, it may be said that LOD lessens the requirement for be anticipated by making more punctures.[13] The Gjonnaess research determined that each ovary received more than 3700 J of electrical energy, whereas Armar et al. reported 640 J [12]. The thermal energy provided to each ovary in the current investigation ranged from 800 to 1600 J. Amer et al. discovered 450 J per ovary at plateau results in the retrospective analysis and suggested further research to determine the ideal amount of thermal energy needed.

Author Year Number

Pregnancy (%) Miscarriage (%ART by 50% in CC-resistant PCOS and is a safe option, especially for women who cannot afford the cost of ART.

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