

Comparison of 5-, 10-, and 15-Point Laparoscopic Ovarian Electrocauterization in Patients With Polycystic Ovarian Disease: a Prospective, Randomized Study

Nasrin Moghadami Tabrizi, MD, Kazem Mohammad, PhD, Hormoz Dabirashrafi, MD, Fahime Irvani Nia, PhD, Parisa Salehi, MD, Babak Dabirashrafi, BS, Shahram Shams, MD

ABSTRACT

Objective: We compared 12-month pregnancy and live birth rates in patients with polycystic ovarian disease undergoing 5-, 10-, and 15-point laparoscopic ovarian electrocauterization.

Methods: This was a prospective, randomized study performed at the Dabirashrafi Fertility and Endoscopy Research Center, Tehran, Iran. The study included 187 patients with polycystic ovarian disease who were randomly assigned to 3 groups. Group I comprised 67 patients whose ovaries received 5-point electrocauterization. Group II comprised 57 patients whose ovaries received 10-point electrocauterization. Group III comprised 63 patients whose ovaries received 15-point electrocauterization.

Laparoscopic ovarian electrocauterization with a unipolar current was used. The main outcome measures were 12-month pregnancy and live birth rates.

Results: Patients were homogeneous for age, body mass index, and type and duration of infertility. Twenty pregnancies resulted in Group I, with a pregnancy rate of 29.9% (20/67) and a live birth rate of 20.9% (14/57). Eighteen pregnancies resulted in Group II, with a pregnancy rate of 31.6% (18/57), and a live birth rate of 28.1% (16/57). Thirty-three pregnancies resulted in group III, with a pregnancy rate of 52.4% (33/63), and a live birth rate of 47.6% (30/63). Comparison of Group III with Groups I and II revealed a statistically significant increase in pregnancies ($P=0.016$) and live birth rates ($P=0.004$).

Conclusion: We recommend 15-point electrocauterization of ovaries in patients with polycystic ovarian disease.

Key Words: Laparoscopic ovarian electrocauterization, Ovarian drilling, Polycystic ovarian disease.

INTRODUCTION

Bilateral ovarian wedge resection is associated with a high incidence of periadenexal adhesions that may jeopardize fertility.¹ Gjoannaess² first reported treatment of polycystic ovarian disease (PCOD) by laparoscopic ovarian drilling. Using a unipolar electrode, he created 5 to 8 craters of 2-mm to 4-mm deep on the ovarian capsule in each ovary. The ovulatory rate after the procedure was 92% with a pregnancy rate of 84%, among women with no other cause of infertility.

In the last decade, different authors have suggested creating different numbers of craters in each ovary;³ however, these studies were not prospective and randomized. So we decided to compare 5-, 10-, and 15-point laparoscopic ovarian electrocauterization in a prospective, randomized study.

The ethics committee at our institution approved this study, and all patients signed a written informed consent.

METHODS

Infertile patients with PCOD with at least 3 of the 4 following criteria were included in the study conducted from February 1999 to February 2004:¹ Oligomenorrhea or amenorrhea,² Hirsutism;³ PCOD on ovarian ultrasonography (more than 10 primary follicles in the cortex of each ovary), and⁴ body mass index (BMI)>22.

All patients had a total serum testosterone level higher than the normal range, or LH/FSH>2 (measured in the early follicular phase of the cycle), or both of these conditions. All patients failed to conceive after 6 cycles of clomiphene citrate therapy and 3 cycles of human menopausal gonadotrophin (HMG) therapy. No patients received any infertility drugs for 4 months before the study. At the time of study entry, each patient was randomly assigned to 1 of the following groups: Group I, each ovary was cauterized to a change in depth of 5 points; Group II, each ovary was cauterized to a change in depth of 10 points; Group III, each ovary was cauterized to a change in depth of 15 points.

All laparoscopies were performed with the patient under general anesthesia with an endotracheal tube installed by

Dabirashrafi Fertility and Endoscopy Research Center Tehran, Iran (all authors).

Financial support was provided by Dabirashrafi Fertility and Endoscopy Research Center, Tehran, Iran.

Address reprint requests to: Dabirashrafi Fertility and Endoscopy Research Center #50-East Hoveizeh St. North Sohrevardi Street, Tehran-1559933411-Iran. Telephone: 9821 88762345, Fax: 9821 88762781, E-mail: Fi12111340@dpimail.net

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Table 1.

Comparison of Age, Body Mass Index, Duration of Infertility, and Percent of Primary Infertility Between Groups I, II and III

| Characteristics | 15 Points (n = 63) | 10 Points (n = 57) | 5 Points (n = 67) | P Value |
|--------------------------------|-----------------------|-----------------------|----------------------|---------|
| Age | 25.7+3.95 | 25.1+3.91 | 26.61+5.62 | 0.107 |
| BMI | 26.69+4.48 | 28.48+4.38 | 27.44+4.62 | 0.98 |
| Duration of infertility | 4.25+3.59 | 3.96+2.48 | 4.48+3.20 | 0.439 |
| Percent of primary infertility | 76.2% | 61.4% | 71.6% | 0.197 |

the senior author of this article. After inserting of an 11-mm trocar intraumbilically, the single laparoscope (Storze, Germany) was passed into the pelvic cavity. Then a 6-mm suprapubic trocar was inserted in the left side. After careful examination of the pelvic cavity, patients with any other abnormality were excluded from the study.

Cauterization of ovaries was performed as recommended by Gjoannaess² by using a unipolar current (300 W to 400 W, 5 to 6 seconds at each point).

At the end of the operation, 500 mL of ringers lactate solution was left in the pelvic cavity as recommended by Naether et al.⁴

None of the patients had any complications after laparoscopy. After excluding the patients from any other pelvic abnormalities, 187 patients remained (67 in group I, 57 in group II, and 63 in group III). All patients were followed up for 12 months. Twelve-month pregnancy and live birth rates were compared among the 3 groups by using Pearson χ^2 .

Each of the 4 confounding variables (age, BMI, duration of infertility, and percentage of primary infertility) were compared among the 3 groups by using 1-way ANOVA.

RESULTS

Table 1 provides a comparison of the age, BMI, duration of infertility, and type of infertility among the 3 groups, with no statistical difference. **Table 2** provides a comparison of 12-month pregnancy rates and live birth rates among the 3 groups. Twelve-month pregnancy rates

($P=0.016$) and live birth rates ($P=0.004$) were statistically different among the 3 groups.

Considering the use of 5 points as the basic method, no significant difference was noted between groups 1 and 2 ($P=0.835$ for 12-month pregnancy rates and $P=0.353$ for live birth rates), but both rates in group 3 were significantly better than those in group 1 ($P=0.009$ for pregnancy rate and $P=0.001$ for live birth rate).

DISCUSSION

In 1984, Gjoannaess² introduced the method of ovarian cauterization via laparoscopy, but the ideal number of points of cauterization came into question. Armer et al³ used 4 points of ovarian cauterization and stated that ovarian diathermy can initiate regular ovulation in women with polycystic ovaries although the mechanism is uncertain. On the other hand, Neather⁴ emphasized the importance of androgen-making tissues. He showed that a decrease in total serum testosterone concentration is proportional to the number of points of cauterization.

However, Armer et al³ believe that using more points of ovarian cauterization increases the risk of periaidexal adhesion that could have negative effects on future pregnancies of the patient.

To our knowledge, no prospective, randomized study answers this contradiction.^{5,6} Our study showed that pregnancy rates and, more importantly, live birth rates are significantly higher at 15 points of cauterization compared

Table 2.

Shows Comparison of Pregnancy Rate and Live Birth Rate Between Groups I, II and III

| Outcomes | 15 Points (n = 63) | 10 Points (n = 57) | 5 Points (n = 67) | P Value |
|--------------------------|-----------------------|-----------------------|----------------------|---------|
| 12 months pregnancy rate | 33 (52.4%) | 18 (31.6%) | 20 (29.9%) | 0.016 |
| Live birth rate | 30 (47.6%) | 16 (28.1%) | 14 (20.9%) | 0.004 |

with 5 points and 10 points. Because more damage to the ovary could increase the risk of adhesion formation and at the same time result in a greater decrease in androgen-making tissues, our study shows that the decrease in androgen-making tissues is more important. Our previous finding,⁷ showing that the rate of adhesion formation after ovarian cauterization is generally low, supports our present findings.

Furthermore, Greenblatt and Casper⁸ found no correlation between the degree of ovarian damage and subsequent adhesion formation.

CONCLUSION

In a prospective, randomized study of 187 patients with PCOD, we found that ovarian cauterization of 15 points results in higher pregnancy and live birth rates compared with the rates with cauterization of 5- and 10-points.

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