Original Article

The Laparoscopic Ovarian Electrocautery Versus Gonadotropin Therapy in Infertile Women with Clomiphene Citrate-Resistant Polycystic Ovary Syndrome; A Randomized Controlled Trial

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Abstract

Objective: This study aimed to compare two methods of treatment of infertility with gonadotropin with laparoscopic ovarian electrocauterization in patients with clomiphene citrate-resistant polycystic ovary syndrome (PCOS).

Methods: A number of 104 nulipara patients with polycystic ovary syndrome, who were resistant to clomiphene citrate were randomly assigned to two groups. One group received gonadotropin; after the bleeding withdrawal and from the third day of the cycle, the injection of human menopausal gonadotropin (HMG) was started with 10 mg medroxy progesterone. The patients were followed with serial trans-vaginal sonographies. When the diameter of follicles reached to 18 mm, human chorionic gonadotropin (HCG) was prescribed. The other group was treated with laparoscopic ovarian electrocauterization under general anesthesia. If after 3 cycles, the an-ovulation was established with progesterone measurement, the clomiphene citrate was prescribed. Gonadotropin was administered, if the lack of ovulation persisted.

Results: No significant difference was documented between the two groups in terms of the obesity indexes, duration of infertility, age, sonographic and laboratory findings. In the gonadotropin group, 37 cases (71%) of pregnancy occurred. The rate of pregnancy was the same in the other group consisting of 18 cases treated by electrocautery, 9 cases with cautery + clomiphene, and 10 cases with clomiphene + cautery + gonadotropin. In the group treated with gonadotropin, there were 1 triple and 4 twins pregnancies. In the group treated with ovarian electrocautery, one twin pregnancy was observed. In the group treated with gonadotropin, 2 cases of ovarian hyperstimulation syndrome, 1 case of ectopic pregnancy and 6 cases of miscarriage occurred; the corresponding figure in the ovarian electrocautery group consisted of 5 cases of miscarriage.

Conclusion: Our findings suggest that ovarian electrocauterization is an appropriate method with good efficacy and low complication rate for infertility treatment of women with clomiphene citrate-resistant polycystic ovary syndrome.

Keywords: Polycystic ovary syndrome, Infertility, Gonadotropin, Ovarian electrocauterization (JPMA 62: S-42; 2012).

Introduction

Polycystic ovary syndrome (PCOS) is the most common endocrinopathy in women of reproductive age. These patients are at risk of infertility, abnormal uterine bleeding, and various metabolic disorders such as insulin resistance, obesity, diabetes mellitus, hypertension, and dyslipidemia.[1,2] Infertility is one of the main complications of PCOS.[3]

In addition to lifestyle change and weight loss, different therapeutic modalities have been proposed in this regard. The mostly used treatment choices include the use of medications as clomiphene citrate, insulin sensitizers, ovulation induction with FSH injections, glucocorticoids, and aromatase inhibitors.[4] Some of these protocols increase the risk of multiple gestation or ovarian hyperstimulation. Some surgical treatments as in vitro fertilization and laparoscopic surgery of ovaries are considered, as well.[4]

The prevalence of PCOS is about 7% among Iranian women.[5,6] So, this study aimed to compare two methods of treatment of infertility with gonadotropin and with laparoscopic ovarian electrocauterization in Iranian women with clomiphene citrate-resistant PCOS.

Methods

This study was approved by the Research and Ethics Committee of School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran (Project No.: 385482). Written informed consent was obtained from all participants. The study comprised 104 infertile PCOS women referred to the Gynecology and Obstetrics clinic of Shahid Beheshti teaching hospital. The nulipara patients aged less than 40 years who were resistant to clomiphene citrate were recruited by convenient sampling. These patients, despite treatment

with 150 mg of clomiphene citrate for 5 days from the third day of the menstrual cycle, had no ovulation for three cycles. Those with male factor infertility or tubal factor were excluded.

Then, by using computer-generated random numbers, patients were randomly assigned to two groups. One group received gonadotropin; after the bleeding withdrawal and from the third day of the cycle, the injection of human menopausal gonadotropin (HMG) was started with 10 mg medroxy progesterone. The patients were followed up with serial trans-vaginal sonographies. When the diameter of follicles reached to 18 mm, human chorionic gonadotropin (HCG) was prescribed.

The other group was treated with laparoscopic ovarian electrocauterization under general anesthesia. Then, 10 to 15 holes were created in each ovary, depending on its size.

If after 3 cycles, the anovulation was established with progesterone measurement, the clomiphene citrate was prescribed. Gonadotropin was administered, if the lack of ovulation persisted.

The patients were followed closely. Pregnancy was confirmed by noticing delay in the menstrual cycle, positive test for ?-hcG, and vaginal ultrasound. The frequency of at least 20 weeks of pregnancy, the number of abortions, number of pregnancies outside the uterus, ovarian hyper stimulation, multiple pregnancies, PCO appearance on ultrasound, LH/FSH ratio and increased serum testosterone were compared in the two groups.

Statistical Analysis:

The chi-square and Fisher's exact test were used for the comparison of frequencies. The Student t-test was used to compare the mean body mass index (BMI) between the two groups.

Results

No significant difference was documented between the two groups in terms of age, obesity indecies, duration of infertility, and sonographic and laboratory findings (Table). Overall, 26.14% of the patients in the group treated with gonadotropin and 28.15% of the patients treated by ovarian electrocauterization had elevated serum concentration of testosterone ($p > 0.05$). 23 patients in the gonadotropin group and 25 patients in the other group had an LH-to- FSH ratio above 2 ($p > 0.05$).

In the group receiving gonadotropin, 37 cases (71%) of pregnancy occurred. This frequency was the same among those patients who underwent ovarian electrocauterization, consisting of 18 patients receiving only electrocauterization, 9 patients with electrocauterization + clomiphene, and 10 patients with electrocauterization + clomiphene + gonadotropin.

Considering the frequency of multiple pregnancies, in the group treated with gonadotropin, 4 twin pregnancies and a triple pregnancy occurred; whereas one case of twin pregnancy occurred in the other group.

Two cases of ovarian hyperstimulation syndrome and one case of ectopic pregnancy occurred in the group treated with gonadotropin, without any case in the other group. Six patients in the group treated with gonadotropin and 5 cases in the other group had abortion ($p > 0.05$).

Discussion

In our study, the success rate of infertility treatment for PCOS women who were resistant to clomiphene citrate was similar in patients receiving gonadotropin and those treated with laparoscopic ovarian electocauterization. However, three months after electrocautery, the pregnancy rates were lower than the group receiving gonadotropin, but with adding clomiphene citrate and gonadotropin, the pregnancy rate raised to 71 percent, i.e. similar to the group receiving gonadotropin.

Our findings are comparable with some other studies conducted in this field. Bayram et al found that the pregnancy rate was 37% after ovarian electrocautery, and 75% after administration of clomiphene citrate and gonadotropin.[7]

In the two different studies by Malkawi et al., the pregnancy rates were 73% and similar in both treatment groups.[8,9]

Also, van Wely et al, in two studies, reported similar pregnancy rate of 68% in patients receiving gonadotropin and those underwent ovarian electrocautery.[10,11]

However, some other studies are not consistent with

Table-1: Characteristics of the study participants.

	Electrocautery (n=52)	Gonadotropin (n=52)	P value
Age (years)*	29.17(5.47)	28.51(5.51)	0.54
Body mass index (Kg/m2)*	27.73(6.16)	27.55(6.07)	0.88
Waist-to-hip-ratio*	0.84(0.09)	0.81(0.08)	0.68
Duration of infertility(years)*	2.9(0.3)	2.8(0.3)	0.59
High serum testosterone (%)	28.15	26.14	0.37
High LH-to-FSH ratio (%)	51	50	0.42
PCO pattern in sonography (%)	69.2	61.5	0.41

*: mean (standard deviation).

these findings. In the study of Farquhar et al, the pregnancy rates were 28% for laparoscopic ovarian diathermy and 33% for three cycles of treatment with gonadotropins.[12]

The advantage of our study was that if those patients who were treated only with electrocautery did not have ovulation, we considered subsequent medical treatment by clomiphene citrate and when necessary, gonadotropin, to prevent the need for intravenous fertilization and embryo transfer.

Laparoscopic ovarian electrocautery is associated with low risk of adhesion formation. The possible side effects of this technique are the potential risks of surgery under general anesthesia and the risk of damage to abdominal viscera and blood vessels. Fortunately, no complications were caused by electrocautery in this study.

We closely monitored the gonadotropin administration with low dose regimen. No major side effects were associated in this method. Only two cases of mild ovarian hyperstimulation and five cases of multiple pregnancies were observed in this group.

Conclusion

Our findings suggest that both methods of ovaries electrocautery and gonadotropin have a comparable effect on the induction of ovulation and pregnancy for women with clomiphene citrate-resistant PCOS.

Acknowledgment

This study was conducted as a specialty thesis (Grant No.: 385482) funded by Isfahan University of Medical Sciences, Isfahan, Iran.

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