

Comparison of IVF-ICSI Outcome of the Patients who Underwent Laparoscopic Cystectomy Due to Ovarian Endometrioma and Male Factor Patients

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ABSTRACT

Objective: It is known that ovarian endometrioma adversely affects fertility. There are conflicting reports about the studies comparing the results of the women with endometrioma and the patients with tubal factor infertility. In this study, we wanted to compare IVF-ICSI outcome of the patients diagnosed as having endometrioma and subsequently underwent laparoscopic cystectomy and the women with male factor infertility.

Materials and methods: The files of the patients who had IVF-ICSI in our clinic were analyzed retrospectively. A total 82 women were included into the study. Group 1 (endometrioma group) consisted of 45 patients who underwent laparoscopic cystectomy because of endometrioma, group 2 (control group) consisted of 37 patients diagnosed as having infertility because of male factor.

Results: Both groups were homogenous in relation with the parameters such as duration of infertility, basal FSH level, basal E2 level and body mass index. Peak E2 level on hCG day was 1583.3 ± 968.6 pg/ml in endometrioma group, and 2443.8 ± 998.9 pg/ml in control group, respectively and the difference was statistically significant ($p < 0.05$). Retrieved oocyte number in endometrioma group was statistically significantly lower than control group (8.5 ± 5.1 vs 11.0 ± 5.2) ($p < 0.05$). Pregnancy rate was 13.3 % and 24.3 % for group 1 and 2, respectively and the difference was statistically significant ($p < 0.05$). There was no difference between the groups in terms of total gonadotropin dose, duration of cycle, metaphase 2 (M II) oocyte number and transferred oocyte number.

Conclusion: According to the results of our study, endometrioma seems to have negative effect on IVF-ICSI outcome. However, it is not known that this negative effect is due to endometrioma or previous surgery.

Key words: Endometrioma, male factor, infertility, IVF-ICSI.

Introduction

In vitro fertilization-intra cytoplasmic sperm injection (IVF-ICSI) has been used world-widely for more than two decades (1). However, the management of the women underwent ovarian surgery due to endometrioma remains controversial. Surgical treatment of endometriomas possesses many risks such as destruction of normal ovarian cortex and inadequate surgery (2). Garcia-Velasco et al reported that endometrioma surgery could lead to a decrease in the follicle numbers even if in well-equipped surgeons (3). It is difficult to decide the treatment of endometrioma in infertile women. Because, either endometrioma or endometrioma surgery could lead to a decrease in follicle numbers and impaired IVF-ICSI outcome (4, 5).

Horikawa et al detected that frequency of ovulation was reduced in infertile women who underwent laparoscopic cystectomy (6). However, the pregnancy rate per ovulation was remained unaffected. When antimullerian hormone (AMH) was used as an ovarian reserve marker, negative outcomes have been reported after ovarian endometrioma surgery (7, 8). Harada et al analyzed the previous studies reporting the effect of excision of unilateral endometrioma on IVF-ICSI outcome (9). On the contrary of the previous reports, they found that the quality of oocytes recovered from the ovary with a history of laparoscopic excision of endometrioma was not inferior to the quality of oocytes from contra-lateral healthy ovary.

Large, prospective, randomized trials are required to evaluate the efficacy of IVF-ICSI in the treatment of infertility caused by endometrioma.

We aimed to compare the IVF-ICSI results of the patients diagnosed as having endometrioma and subsequently underwent laparoscopic cystectomy and the women with male factor infertility.

Materials and methods

Eighty two women undergoing IVF-ICSI due to infertility at Zekai Tahir Burak Women Health Training and Research Hospital, Ankara, Turkey, between August 2014 and August 2015 were enrolled into this case-control study. The study was reviewed and approved by the local ethics committee. Normoresponder patients were included in the study. Exclusion criteria were having FSH > 15 IU/l, having antimullerian hormone level < 1 ng/ml and antral follicle number < 4 on the second day of menstruation. Testicular sperm extraction (TESE) performed patients and the patients with frozen-thawed embryo transfer were not included in the study.

Two groups were formed for the study population: Group 1 (endometrioma group) consisted of 45 patients who underwent laparoscopic cystectomy because of endometrioma, group 2 (control group) consisted of 37 patients diagnosed as having infertility because of male factor. Endometrioma ve male factor fertilité grubunu tanımlamak lazim. Bilat-unilat belirtmek lazim

Gonadotrophin stimulation for ART, oocyte retrieval and sample collection:

Flexible daily GnRH antagonist protocol was preferred to induce pituitary down regulation (Cetrotide 0.25 mcg, Serono). Controlled ovarian hyperstimulation (COH) was performed with gonadotrophin starting, 225-300 IU rec-FSH (Gonal-F; Serono, Istanbul) and/or HMG (Menogon, Ferring) daily, on cycle

day three. Serial E₂ levels and two-dimensional follicle measurements by transvaginal ultrasound imaging (GE Logiq 200 Alpha®, General Electric, Korea) were performed until at least two dominant follicles reached dimensions of 18 mm or greater in diameter and daily dosing was determined individually. GnRH antagonist was started when the leading follicle reached a diameter of 12-14 mm. Human chorionic gonadotrophin (Pregnyl, 10.000 U, im, Organon, Netherland) was administered when the leading follicle became 18 mm. ICSI bvařta kısalttın was performed in all patients according to our clinical practice. Luteal phase support was routinely given as progesterone in the form of Crinone 8% gel (Serono, Istanbul) 90 mg daily for 14 days, when a pregnancy test was performed. In case of pregnancy, progesterone was given until the 12th gestational week.

The primary end point of the study was the clinical pregnancy rate after IVF-ICSI treatment.

Clinical pregnancy was diagnosed by the ultrasound demonstration of heart-beat in an intrauterine gestational sac. Ongoing pregnancies were followed in our hospital.

Statistical analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (17.00 SPSS Inc., Chicago). The Chi-square test was used for categorical variables and an independent sample t test was used for continuous variables that were normally distributed. P value < 0.05 was considered significant.

Results

A total, 82 women were allocated into the study. Age, basal TSH level, basal FSH level, basal E₂ level, antral follicle count (AFC) and body mass index (BMI) were evaluated but, there was no statistical difference (Table 1).

Table 1. Characteristics of the patients.

	Group 1 (n=45)	Group 2 (n=37)	p
Age (year)	30.0 ±4.1	28.4 ±4.3	0.66
Basal TSH level	2.2 ±1,0	2.2 ±1,0	0.83
Basal FSH level (iu/l)	6.9 ±1,8	6.4 ±1,3	0.14
Basal E2 level (pg/ml)	46.4 ±21.3	48.3 ±18,5	0.31
AFC	2.1 ±0.6	2.0 ±0.6	0.81
BMI	23.9 ±3.4	26,3 ±4.2	

AFC means antral follicle count, BMI:, TSH, FSH, E2

Table 2. Comparison of in vitro fertilization-intracytoplasmic sperm injection outcome between the study group and the control group.

	Group 1 (n=45)	Group 2 (n=37)	p
Total gonad. dose	2377.1±1099.3	3132±846.4	0.28
E ₂ on day of hCG (pg/ml)	1583.3±968.6	2443.8±998.9	<0.01*
End. line on day of hCG (mm)	9.4±2.6	10.2±1.9	0.11
Retrieved oocyte number	8.5±5.1	11±5.2	0.04*
M II oocyte number	6.7±4.4	8,2±3.4	0.09
Transferred embryo number	1.1±0.6	1.1±0.3	0.84
Clinical pregnancy rate, n (%)	6 (13.3)	9 (24.3)	<0.01*

* means statistically significant

The two groups were also compared according to the total gonadotropin dose, E₂ levels on the day of hCG administration, retrieved oocyte number, metaphase 2 oocyte number, transferred embryo number, and clinical pregnancy rate (Table 2). E₂ levels on the day of hCG administration was 1583.3±968.6 (pg/ml) and 2443.8±998.9 (pg/ml) in group 1 and 2, respectively and this difference was found to be statistically significant ($p < 0.05$). Clinical pregnancy rate was significantly lower in group 1 than group 2 (13.3 % vs. 24.3 %) ($p < 0.05$).

Discussion

In this case-control study, IVF-ICSI outcome of the patients diagnosed as having endometrioma and subsequently underwent laparoscopic cystectomy and the women with male factor infertility were compared. Our study has shown that IVF-ICSI outcome were worse in the patients with a history of laparoscopic cystectomy due to endometrioma than the women having infertility because of male factor.

Endometrioma has adverse effects on ovarian follicles, embryos, and endometrium. Also, surgical resection may have a negative impact on IVF-ICSI outcome due to the possible reduction in the number of growing follicles and retrieved oocyte number (10). The type of laparoscopic technique which is chosen during surgery could be important on IVF-ICSI outcome. Donnez et al reported that vaporization or fenestration were better than cystectomy (11).

Later, Alborzi et al indicated that laparoscopic cystectomy was superior to fenestration because of lower recurrence rate and a higher cumulative pregnancy rate (12). In conclusion, ovarian cystectomy for endometriomas was found to be with the least ovarian damage and serum AMH levels (13).

In our study, although laparoscopic cystectomy was used in all endometrioma cases; E₂ levels on the day of hCG, retrieved oocyte number and clinical pregnancy rate were significantly lower in endometrioma group than control group ($p < 0.05$). Our results were consistent with the previous studies (3,14). Although Demiroglu et al have reported that clinical pregnancy rates and implantation rates were not negatively influenced by endometrioma cystectomy, we found that E₂ levels on the day of hCG administration and clinical pregnancy rates were lower in endometrioma group (15).

Despite the enormous improvements in assisted reproduction techniques, treatment of the patients with endometrioma still remains a challenge. We aimed to demonstrate the efficacy of endometrioma surgery on IVF-ICSI outcome. The limitation of our study was the restricted number of patients.

Conclusion

As a result, ovarian surgery might lead to a decrease in clinical pregnancy rates. However, large prospective randomized trials are needed to evaluate either endometrioma or endometrioma surgery on IVF-ICSI outcome.

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