

Functional Cyst Aspiration At The Beginning Of ICSI Cycle Does Not Have Detrimental Effect on ICSI Outcomes

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OBJECTIVE: The aim of our study is to investigate the effect of functional simple cyst aspiration at the beginning of intracytoplasmic sperm injection (ICSI) cycles on controlled ovarian hyperstimulation (COH) and ICSI outcomes. Design retrospective case-control study.

STUDY DESIGN: Fifty consecutive patients (69 cycles, Group I) who underwent functional cyst aspiration at the beginning of ICSI cycle were enrolled retrospectively via our computerized IVF database system. The control group was constituted from the 70 patients (99 cycles, tubal factor infertility, Group II).

RESULTS: Controlled ovarian hyperstimulation responses, embryological data and pregnancy outcome of both groups were all comparable.

CONCLUSION: Functional simple cysts aspiration at the beginning of ICSI cycles does not have detrimental effect on both COH and ICSI outcomes.

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Key Words: Functional ovarian cysts, IVF, ICSI, Assisted reproductive techniques, Pregnancy

Functional ovarian cysts appear uncommonly at the beginning of the ovarian stimulation in In-vitro fertilization (IVF) /Intracytoplasmic sperm injection (ICSI) cycles.^{1,2} The most probable etiology of developing functional ovarian cysts is the initial stimulatory or flare-up effect of the gonadotropin release hormone analogs (GnRH-a).³

Patients with functional ovarian cysts represent a decision challenge for proper management. Some authors recommend aspiration of the cysts;^{1,4,5} others continue with the analogue administration, maintaining a conservative management until ovarian suppression is achieved.^{6,7} Aspiration of functional ovarian cysts before the beginning of the ovarian stimulation may result comfortable oocyte pick-up (OPU) procedure since there is no ovarian cysts during OPU. However, the effect of functional ovarian cysts aspiration on IVF/ICSI outcomes is not well established.

The aim of our study is to investigate the effect of functional simple cysts aspiration at the beginning of intracytoplasmic sperm injection (ICSI) cycles on controlled ovarian hyperstimulation (COH) and ICSI outcomes.

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Materials and Methods

Fifty consecutive patients (69 cycles, Group I) who underwent functional cyst aspiration at the beginning of ICSI cycle were enrolled retrospectively via our computerized IVF database system. The control group was constituted from the 70 patients (99 cycles, tubal factor infertility, Group II). All patients in Group I and Groups II underwent controlled ovarian hyperstimulation consisting of luteal-long leuprolide acetate and recombinant FSH or urinary FSH using the step-down protocol. The criterion for hCG administration was the presence of 3 or more follicles exceeding 17 mm in diameter. Standard procedures were carried out for gamete-embryo handling and day three embryo transfer was performed in all cases using soft catheter. Luteal phase was supported by daily vaginal progesterone suppositories starting one day after oocyte pick-up.

The Chi-square and Fisher's Exact test were used to analyze nominal variables in the form of frequency tables. Normally distributed (Kolmogorov-Smirnov test) parametric variables were tested by independent sample t test. Non-normally distributed metric variables were analyzed by Mann-Whitney U-test. Values were expressed as mean \pm SD, unless stated otherwise.

Results

The baseline characteristics and the controlled ovarian hyperstimulation responses of Group I and Groups II were shown in Table 1. The embryological data and pregnancy outcome of groups were summarized in Table 2.

Table 1. The baseline characteristics of the Group I and Group II

Variable	Group I	Group II	P value
	(Simple Cysts Aspiration)	(Tubal Control)	
No. of patients	50	70	
No. of cycles	69	99	
No. of canceled cycles (n, %)	11 (15.9)	12 (12.1)	NS
Female age (y)	31.9±5.1	32.2±4.9	NS
Body mass index (kg/m ²)	25.0±4.0	25.5±4.0	NS
FSH levels on Day 3	8.8±4.2	9.1±5.6	NS
Duration of stimulation (d)	9.7±1.9	11.2±3.9	NS
No. of follicles >17 mm in diameter at hCG administration	2.9±1.7	3.0±1.6	NS
No. of follicles 15-17 mm in diameter at hCG administration	3.2±2.3	2.9±2.0	NS
Total dose of FSH used (IU)	3148.8±1555.9	3538.2±1761.9	NS
E2 level on the day of hCG administration (pg/mL)	2283.7±1667.6	1960.2±1336.4	NS
Endometrial thickness on the day of hCG administration (mm)	10.7±1.7	9.9±2.6	NS

NS=not significant

Table 2. The embryological data and pregnancy outcome of the Group I and Group II

Variable	Group I	Group II	P value
	(Cysts Aspiration)	(Tubal Control)	
No. of oocyte-cumulus complexes	11.7±6.3	10.1±6.6	NS
No. of metaphase II oocytes	8.9±5.0	8.2±5.5	NS
No. of 2-pronuclei oocytes	6.6±4.7	6.2±4.8	NS
No. of GV embryos	0.6±0.9	0.4±0.8	NS
No. of M1 embryos	0.5±0.8	0.5±0.9	NS
No. of total embryos on day 3	6.9±4.8	6.4±4.7	NS
No. of embryos transferred	3.1±1.3	2.8±1.4	NS
Clinical pregnancy/embryo transfer (%)	44.9	42.4	NS

NS=not significant.

Discussion

The incidence of functional ovarian cysts in assisted reproductive cycles is quite different. The incidence was reported in several studies as that it ranges from 6% to 25%.^{8,9} Herman et al.⁷ in 1990 reported the average incidence as 13.6%. Functional ovarian cysts are usually associated with higher serum estradiol (E2) levels even though there is complete pituitary desensitization.

Several studies suggested that the baseline functional simple cysts do not negatively affect controlled ovarian hyperstimulation for ICSI. In a retrospective study of 97 IVF cycles it was reported that there was no differences in 21 cyst cycles versus 76 non-cyst cycles in peak E2 levels, number of follicles, oocytes and embryos transferred, cycle cancellation, or pregnancy rates.¹⁰ Parinaud et al.¹¹ determined the association of ovarian cysts with basal endocrine profiles and IVF results in 914 IVF cycles. They found that these cysts were not related to a particular basal endocrine profile and did not impair follicular growth and IVF results. Penzias et al.¹² reported that when comparing the same patient in cycles with and without

baseline cystic structures, there are no differences in the quality of stimulation or pregnancy rates. Our study confirmed these results. We noted that, embryological and pregnancy outcome of the functional simple cysts aspirated group and control groups were comparable. In other words, aspiration of functional simple cysts just at the beginning of the stimulation protocol did not have any detrimental effect on ICSI outcomes.

However, the exact problem is the whether we should aspirate functional ovarian cysts before beginning of the stimulation or not. Concerning this problem there are conflicted studies in the literature. Some studies suggested that the presence of baseline ovarian cysts has been proposed to decrease the success of controlled ovarian hyperstimulation for ART.^{6,13} Segal et al.¹³ found poorer outcome after IVF-embryo transfer (ET) in patients with baseline cysts. They reported that baseline ovarian cysts may impair folliculogenesis by mechanical effect in which the presence of an ovarian cyst reduces the area for follicular development or by an effect on local angiogenesis. Keltz et al.⁶ investigated the prognostic significance of baseline ovarian cysts for IVF-ET in 78 patients. They

found cycles with cysts were associated with significantly older patients with significantly higher baseline FSH values and those who had fewer follicles, retrieved oocytes, lower peak E2 levels, lower implantation rates, and clinical pregnancy rates (7.7% vs 32.7).

On the contrary, Fiszbajn et al.¹⁴ compared the aspirations of the functional simple cysts (n=14) versus conservative management (observation) (n=45). Total number of ovarian follicles developed, number of oocytes retrieved, estradiol levels on the day of human chorionic gonadotropin, fertilization rate, number of good quality embryos transferred, implantation, and clinical pregnancy rate per cycle were evaluated. They reported that no statistical differences were observed between the two groups in any parameters. However, Levi et al.¹⁵ recently investigated the effect of functional ovarian cysts on IVF outcomes. They showed that, baseline ovarian cysts have a negative impact on the quality of ovarian hyperstimulation procedure; however, they have no negative effect on the pregnancy rates in IVF cycles.

In conclusion, we noted that functional simple cysts aspiration at the beginning of ICSI cycles does not have detrimental effect on both COH and ICSI outcomes.

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