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Original Article

Role of Hysteroscopy Prior to Assisted Reproduction Techniques

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ABSTRACT **Study Objective:** To determine whether diagnostic hysteroscopy before assisted reproduction techniques (ART) in women without known disease of the uterine cavity is necessary.

Design: Prospective cohort clinical study.

Setting: Reproductive medicine clinic.

Patients: The study group consisted of 217 infertile women attending the Reproductive Clinic for examination before undergoing ART, either in vitro fertilization or intracytoplasmic sperm injection.

Interventions: Patients underwent transvaginal sonography (TVS) and hysterosalpingography (HSG) for initial evaluation. If there were no abnormal intrauterine findings, diagnostic hysteroscopy was additionally performed.

Measurements and Main Results: The safety and diagnostic value of hysteroscopy before ART was examined. Diagnostic hysteroscopy was performed successfully, without complications, in all 217 women. Ninety-five (43.7%) had a history of ART failures (group 1), and 122 (56.3%) had undergone no previous ART attempts (group 2). In 148 women (68.2%), findings at hysteroscopy were normal, whereas in 69 (31.8%), hysteroscopy revealed intrauterine lesions (polyps, septa, submucosal leiomyomas, or synechiae) that led to operative hysteroscopy. The most common intrauterine abnormality was the presence of endometrial polyps in 26 patients (12%). The total percentage of abnormal intrauterine findings was higher in women with a history of repeated ART failures in comparison with those with no history of ART attempts. No statistically significant difference in the outcome of in vitro fertilization or intracytoplasmic sperm injection was observed between women with normal hysteroscopic findings and patients with hysteroscopically corrected endometrial disease.

Conclusion: Sensitivity of diagnostic hysteroscopy is significantly higher than TVS and HSG in the diagnosis of intrauterine lesions. Diagnostic hysteroscopy should be performed before ART in all patients, including women with normal TVS and/or HSG findings, because a significant percentage of them have undiagnosed uterine disease that may impair the success of fertility treatment. Journal of Minimally Invasive Gynecology (2014) 21, 233–237 © 2014 AAGL. All rights reserved.

Keywords: Assisted reproduction techniques; Hysterosalpingography; Hysteroscopy; Infertility; Intracytoplasmic sperm injection; In vitro fertilization

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Uterine factors represent only 2% to 3% of causes of infertility; however, abnormal intrauterine findings are present in approximately 25% of infertile women [1]. These lesions can interfere with spontaneous fertility and can compromise pregnancy rates in assisted reproduction. Therefore, diagnosis and treatment of intrauterine disease becomes necessary before performance of assisted reproductive techniques (ART) [2]. In general, hysterosalpingography (HSG), transvaginal sonography (TVS), sonohysterography, or hysteroscopy are performed to detect such lesions as well as other disease of the female genital system. The advantage of hysteroscopy is that it offers the opportunity not only of diagnosis but also therapy in the same session, under direct view. With the progress of technology, hysteroscopy today is a simple, safe, and cost-effective outpatient procedure for

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diagnosis and treatment of intrauterine lesions. It is associated with a high diagnostic and therapeutic success rate of >85% for management of endometrial disease [2].

Although hysteroscopy is considered the criterion standard, controversy still exists between TVS and hysteroscopy insofar as diagnosis of intrauterine disease. In most infertility programs worldwide, TVS and HSG are performed to examine the endometrial cavity before ART [3,4]. Hysteroscopy is recommended only when an abnormal intrauterine finding is detected via TVS or HSG to confirm the diagnosis and remove the lesion [5]. In addition, hysteroscopy follows in most cases after repeated ART failures [6]. The objective of the present study was to determine whether routine hysteroscopy before ART, even in women without pathologic TVS or HSG findings, should be recommended.

Table 1

Patient characteristics

Variable	Previous ART (n = 95)	No previous ART (n = 122)	p value
Age, yr, mean	34.1	33.4	>.05
Type of infertility, No. (%)			
Primary	69 (72.5)	87 (71.3)	>.05
Secondary	26 (27.4)	35 (28.7)	>.05
Duration of infertility, yr	5.3	4.4	>.05
Cause of infertility, No. (%)			
Male factor	35 (36.8)	49 (40.1)	>.05
Ovarian factor	10 (20)	23 (18.8)	>.05
Tubal factor	19 (20)	26 (21.3)	>.05
Unexplained	17 (17.9)	24 (19.6)	>.05

ART = assisted reproduction technique.

Material and Methods

This prospective cohort clinical study was performed at Aretaieion University Hospital (Athens, Greece) between January 2007 and May 2013. The study group consisted of women attending the Assisted Reproduction Clinic for investigation of infertility. Inclusion criteria were primary or secondary infertility, age <40 years, body mass index <30, follicle-stimulating hormone level <10 IU/L, and regular menstrual cycle every 26 to 35 days. Exclusion criteria were known presence of endometriosis or adenomyosis and history of recurrent miscarriage. The diagnostic workup included medical history, gynecologic examination, TVS, HSG, semen analysis, and hormone profile (FSH, luteinizing hormone, estradiol, prolactin, thyroid-stimulating hormone, and anti-müllerian hormone at days 2 to 4 of menses).

All infertile women with normal intrauterine findings during HSG and TVS were included in the study after detailed counselling. In these cases, diagnostic hysteroscopy followed as routine investigation before ART, either in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI). No patients refused to participate in the study. Patients with a diagnosis of intrauterine disease after TVS or HSG were excluded from the study. The primary objective of the present study was to identify via hysteroscopy the incidence of intrauterine anomalies that were undetected during HSG or TVS. The secondary objective was to estimate the clinical pregnancy rate and the ongoing pregnancy rate after an IVF or ICSI attempt in patients with normal or abnormal hysteroscopic findings and with or without previous IVF/ICSI attempts.

In total, 217 infertile women aged 24 to 40 years were included in the study (Table 1). Ninety-five patients had a history of ART attempts (group 1), and 122 patients had no history of ART attempts (group 2).

According to the clinical study protocol, diagnostic hysteroscopy was performed using a 4-mm diameter, 30-degree hysteroscope (Karl Storz GmbH & Co. KG, Tuttlingen, Germany). The gynecologists involved were highly experienced in diagnostic and operative hysteroscopy (P.B., D.H., N.V., O.G.). In all patients, hysteroscopy was scheduled to be performed during the follicular phase of the menstrual cycle, usually immediately after cessation of menses, to afford a better view and easier detection of intrauterine abnormalities.

Patients were placed in the lithotomy position, with comfortable leg rests, with the perineum at the edge of the couch and the coccyx and sacrum well supported by the table. The vulva and vagina were disinfected with povidone-iodine. The procedure was generally performed without dilation using normal saline solution as the distention medium. All patients were given 200 μg misoprostol vaginally or orally at 12 hours before the procedure, for cervical ripening. Hysteroscopic evaluation began at the cervical external os. The endometrial cavity was examined under direct view, and the location of the uterine ostia was identified. A video system was used to record the procedure as baseline for future reference. At the end of the procedure, all patients underwent endometrial curettage. After hysteroscopy, patients were observed for a mean of 3 hours for possible adverse effects and postoperative complications.

Hysteroscopic findings were collected on a special data form that included the following: i) patient characteristics (name, age, gynecologic history, and date of the procedure); ii) intraoperative data (hysteroscope, volume and type of distention medium, duration of procedure, type of analgesia, and antibiotic prophylaxis); iii) appearance of the endocervical canal and endometrium (endocervicitis, endometritis, and hyperplastic endometrium); iv) shape of the uterine cavity; v) visualization of uterine ostia; vi) description of possible pathologic findings (cervical stenosis, endocervical and/or endometrial polyps, submucosal leiomyomas, septa, synechiae, and intrauterine foreign body) and their location using a graph of the uterine cavity; vii) method of operative hysteroscopy used in patients with a diagnosed disease); and viii) intraoperative complications. Diagnostic hysteroscopy was performed 1 to 4 months before ART. In addition, in all patients, vaginal swabs