

Comparison of hydrososonography and diagnostic hysteroscopy in the evaluation of infertile patients

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Summary

Objective: In the present study we evaluated the value of hydrososonography in the screening for intracavitary structural pathologies in patients with a history of infertility before the implementation of assisted-reproductive technology. Hysteroscopy was regarded as the gold standard procedure.

Study design: A retrospective study.

Material and methods: A total number of 115 infertile women aged between 19 and 47 (33.4 ± 5.3), who were candidates for assisted reproductive techniques, were enrolled in this retrospective analysis. The study comprised data obtained from patients undergoing infertility investigation between 2001 and 2003 at Ozel Ege IVF Center and the Department of Obstetrics and Gynecology of Ege University Faculty of Medicine. The results obtained by hydrososonography were later compared with those of hysteroscopy. Sensitivity, specificity, positive predictive value and negative predictive value for hydrososonography were calculated.

Results: In a total of 115 women, 53 (46%), 24 (20%), 30 (26%) and 8 (7%) were found to have normal endometrial cavities, submucous myoma, endometrial polyps and uterine septum, respectively, on hydrososonography. Forty-five (85%) of 53 women, who were supposed to have normal findings on hydrososonography, were confirmed by hysteroscopy. In the remaining eight women (15%), two had endometrial polyps, three had uterine septum, one had submucous myoma and two had intrauterine synechia on hysteroscopic examinations. The sensitivity, specificity, positive and negative predictive values of hydrososonography in the detection of structural endometrial cavity lesions were 85%, 75%, 75% and 84%, respectively. Two intrauterine adhesions were not recognized by hydrososonography.

Conclusion: Hydrososonography may be a useful tool in the evaluation of intrauterine cavity structural pathologies in infertile patients with the exception of intrauterine adhesions. In addition, hydrososonography was found to be sensitive in the detection of intrauterine septum.

Key word: Infertility; Intrauterine cavity pathology; Hydrososonography; Hysteroscopy; ART.

Introduction

Evaluation of intrauterine structural lesions is among the routine procedures in the analysis of infertile patients. Methods like transvaginal sonography and hysterosalpingography have been used for decades in the evaluation of the uterine cavity in patients presenting with a history of infertility.

Although the diagnostic value of hysterosalpingography is reported to be comparable with that of hysteroscopy, hysteroscopy has been considered as the gold standard method for detection of uterine cavity pathologies [1-4]. Hysteroscopy allows direct visualisation of the uterine cavity where immediate resection of a suspected lesion is possible. However, hysteroscopy is an invasive procedure associated with some discomfort necessitating the use of anesthesia and requires a skilled practitioner.

Hydrososonography is a new diagnostic technique in which the endometrial surface is visualized by the use of transvaginal sonography while distending the uterine cavity with saline solution. Hydrososonography may be useful in the assessment of the uterine cavity as it is less invasive and requires less skill, causes minimal discomfort and can be performed more quickly than hysteroscopy [5, 6].

In our study, we compared the efficacy of hydrososonography to that of hysteroscopy in the screening of endometrial structural pathologies in patients with a history of infertility.

Material and Methods

A total number of 115 infertile women aged between 19 and 47 (33.4 ± 5.3), who were candidates for assisted reproductive techniques, were enrolled in this retrospective analysis. The study comprised data obtained from patients undergoing infertility investigation between 2001 and 2003 at Ozel Ege IVF Center and the Department of Obstetrics and Gynecology of Ege University Faculty of Medicine. After obtaining a verbal informed consent, hydrososonography was performed in each patient by the same gynecologist at the IVF center. Hysteroscopy was applied to all patients as a part of a routine procedure during the evaluation of candidates for assisted reproductive technologies.

Ultrasonographic examinations were performed using Sono-line Elegra (Siemens, Germany) equipment with a 4.5-7.2 MHz frequency vaginal probe (6.5EV13). A speculum with a side-arm screw was inserted into the vagina and the cervix was cleaned with povidone-iodine solution. An 8F pediatric Foley catheter with a plastic guide was introduced into the uterine cavity with the aid of a ring forceps. The 1 ml balloon at the catheter tip was inflated with the least amount of sterile saline

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solution (0.5 ml) necessary to retain the catheter above the internal cervical os. Then a transvaginal probe was inserted after the speculum was removed carefully from the vagina. Sterile saline was instilled slowly into the uterine cavity under continuous observation with transvaginal sonography. The uterine cavity and its underlying endometrium were evaluated in both the sagittal and transverse sections with great attention to the contours, thickness, smoothness, and echogenicity. Endometrial structural pathology was accepted if there was focal or diffuse thickening of the endometrium with irregular contours and disruption of the endometrial echo and contour. All findings were recorded as normal or endometrial structural lesions.

Office hysteroscopy was performed on all patients by the use of intravenous anesthesia. Antibiotic prophylaxis was given to all patients after the procedures.

The results of hydrosonegographic examinations were later compared with those of hysteroscopic examinations. Sensitivity, specificity, positive predictive value and negative predictive value for hydrosonegography were calculated. Data was expressed as mean \pm standard deviation.

Results

Endometrial cavities with smooth surfaces were regarded as normal whereas submucous myoma or endometrial polyps, uterine septum and intrauterine synechia were all regarded as intrauterine structural lesions.

In a total of 115 women 53 (46%), 54 (47%), and 8 (7%) were found to have normal endometrial cavities, submucous myoma/endometrial polyp and uterine septum, respectively, on hydrosonegography. Forty-five (85%) of 53 women, who were supposed to have normal findings on hydrosonegography, were confirmed by hysteroscopy. In the remaining eight women (15%), two had endometrial polyps, three had uterine septum, one had submucous myoma and two had intrauterine synechia on hysteroscopic examination.

Hysteroscopy confirmed submucous myoma/endometrial polyps in 37 (68.5%) of 54 women who were diagnosed by hydrosonegography. The diagnosis of uterine septum by hydrosonegography was confirmed by hysteroscopy in all of the eight women. Table 1 summarizes the hydrosonegographic and hysteroscopic findings.

The sensitivity, specificity, positive and negative predictive values of hydrosonegography in the detection of structural endometrial cavity lesions were 85%, 75%, 75% and 85%, respectively. Two intrauterine adhesions were not recognized by hydrosonegography.

Table 1. — Findings of hysteroscopy and hydrosonegography.

	Hysteroscopy				Total
	Normal	Myoma/polyps	Septum	Synechia	
<i>Hydrosonegography</i>					
Normal	45	3	3	2	53
Myoma/polyps	15	37	2	—	54
Septum	—	—	8	—	8
Synechia	—	—	—	—	—
Total	60	40	13	2	115

Discussion

Structural lesions of the endometrium including polyps, submucosal myomas, uterine septum, and intrauterine adhesions have been encountered during the work-up for infertile patients. The accuracy of transvaginal sonography as a preliminary diagnostic tool in the evaluation of the uterine cavity in infertile patients is limited as small structures may be missed or overlooked [7]. When hysteroscopy was used as the reference method, hydrosonegography was found to have a sensitivity of 96% and specificity of 88% [8].

The hydrosonegographic diagnosis of submucous myoma/endometrial polyps was confirmed by hysteroscopy in 68.5% of the cases. Two cases of intrauterine septum were also misdiagnosed as endometrial polyps by hydrosonegography. This may be explained by the fact that polyps were visualised as nonspecific endometrial thickening. Wolman *et al.* [9] stated that endometrial folds might become thickened during the secretory phase of the cycle and simulate small, single or even multiple endometrial polyps. In their series, they found three (27%) false-positive cases out of 11 patients in the group who had hydrosonegography during the luteal phase.

Darwish *et al.* [10] reported that hydrosonegography had a similar accuracy to hysterosalpingography in the evaluation of the uterine cavity in infertile patients. Hydrosonegography was reported to be a useful adjunct for in the evaluation of uterine cavities in infertile patients before assisted reproductive technology [11, 12]. In our study hydrosonegography was found to have a low false negative rate with a sensitivity of 85% in the screening for intracavitary structural pathology in infertile patients. In addition hydrosonegography was found to be sensitive in the detection of intrauterine septum [13]. In our study all eight cases of septate uteri diagnosed by hydrosonegography were proved to be so by hysteroscopy.

In a recent systematic review for the determination of the accuracy of transvaginal ultrasonography, hydrosonegography and diagnostic hysteroscopy for the investigation of abnormal uterine bleeding in premenopausal women, all three diagnostic tests were moderately accurate in detecting intrauterine pathology. However, hydrosonegography and hysteroscopy performed better than transvaginal ultrasound in detecting submucous fibroids [14].

Infertile patients represent a group with a high incidence of uterine cavity diseases and the detection and treatment of uterine cavity abnormalities are closely relevant to final therapeutic success. We concluded that hydrosonegography may be a useful tool in the preliminary evaluation of intrauterine cavity pathologies in infertile patients.

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