

Sonohysterography of the Uterine Cavity with Hysteroscopic Correlation in the Investigation of Infertility

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Received 25 July 2007; received in revised form 03 December 2007; accepted 18 December 2007;
published online 12 June 2008

Abstract

Objective: To compare the efficiency of sonohysterography (SHG) and hysteroscopy in the diagnosis of intrauterine pathologies in a population of infertile women.

Materials and Methods: With a mean age of 32 years (range 20-45) 122 infertile women underwent SHG with sterile saline solution followed by hysteroscopy. The clinical findings obtained by SHG and hysteroscopy were compared. sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of SHG compared to hysteroscopy were calculated.

Results: The SHG sensitivity and specificity compared with hysteroscopy were 12.8% and 97.3% respectively. The 2.7% false positive rate and 75% PPV detected with sonohysterographic evaluation.

Discussion: It was concluded that hysteroscopy is superior to SHG in the diagnosis of intrauterine pathologies. Because, it enables the interference of endometrial lesions it may be logical to perform office hysteroscopy to all infertile women undergoing IVF.

Keywords: infertility, hysteroscopy, sonohysterography, uterine pathology

Özet

İnfertilitede Uterin Kavitenin Histeroskopi ve Sonohisteroskopi ile İncelenmesinin Uyumu

Amaç: İnfertil hasta popülasyonundaki intrauterin patolojilerin tanısında histeroskopi ile sonohisterografinin etkinliğinin karşılaştırılması.

Materyal ve Metot: Ortalama yaşı 32 (20-45 arası) olan 122 infertil hastaya steril salin solüsyonu ile sonohisterografiyi takiben histeroskopi yapıldı. Sonohisterografi ve histeroskopiyle saptanan klinik bulgular karşılaştırıldı. SHG ve histeroskopinin sensitivite, spesifite, pozitif prediktif değer, negatif prediktif değerleri hesaplandı ve karşılaştırıldı.

Sonuçlar: SHG ile histeroskopinin sensitivite ve spesifitesi karşılaştırıldı ve sırası ile %12.8 ve %97.3 olarak saptandı. Sonohisterografik değerlendirmede yalancı pozitiflik oranı %2.7, pozitif prediktif değer %75 olarak hesaplandı.

Tartışma: İnauterin patolojilerin saptanmasında, histeroskopinin SHG'ye göre daha üstün olabileceği sonucu çıkarıldı. Endometriyal lezyonlara müdahale edebilme imkânı da verdiği için, her infertil kadına IVF programı öncesi rutin ofis histeroskopi önermek akılcı bir yaklaşım gibi görünmektedir.

Anahtar sözcükler: infertilite, histeroskopi, sonohisterografi, uterin patoloji

Introduction

Implantation failure after embryo transfer (ET) is one of the main problems of *in vitro* fertilization (IVF). Embryo implantation depends mainly on embryo quality and uterine receptivity. Uterine cavity pathologies may affect

endometrial receptivity and implantation (1). The evaluation of the uterine cavity therefore is an important part of the screening process before starting an IVF program.

Sonohysterography (SHG) involves transcervical instillation of sterile saline into the endometrial lumen during transvaginal sonography (TVS). The saline distends the uterine cavity, enabling the anechoic fluid to exquisitely delineate the echogenic endometrium. SHG was demonstrated to be effective and highly sensitive for diagnosis of endometrial polyps, submucous fibroid,

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synechia, and uterine anomalies (2-4). SHG, is an easy, safe, and well tolerated alternative to diagnostic hysteroscopy. In addition, compared with hysteroscopy, SHG is less invasive and less costly.

Hysteroscopy is considered the gold standard for the diagnosis of uterine cavity pathology and it is suggested should be part of the basic infertility work-up (5). Hysteroscopy allows direct visualisation of the benign endometrial abnormalities such as chronic endometritis, polyps, submucous leiomyomata and intrauterine adhesions where immediate resection these lesions are possible. Although hysteroscopy is an invasive procedure, most references suggest that office hysteroscopy is a well-tolerated procedure and recommend analgesic use only in selected patients (6,7).

In our study, we compared the efficacy of SHG to that of hysteroscopy in the screening of endometrial structural abnormalities in infertile women.

Materials and Methods

The study was performed at the Prof. Dr. M. Turan Çetin Women Health and IVF Center. The study group comprised 122 patients with primary infertility. Our study was performed with their permission. Initially, all patient were evaluated with TVS using a transvaginal probe with a 7.5 MHz transducer (Siemens-Sonoline Adara, Germany). After, SHG was performed with the patient in the dorsal litotomi position. Standart vaginal speculum was inserted to vagina and cervix was cleaned by serum physiologic solution. Cervix was not grasped by tenaculum. The canule was inserted through the cervical ostium and was not required to ring forceps. Average 20 cc syringe was attached to the canule (Wallace catheter, USA) and the uterine cavity was distended with sterile saline solution. After, the transvaginal probe was inserted posterior cervical fornix and uterin cavity was visualized with this probe. The evidence was recorded by author.

All office hysteroscopies were performed in the early proliferative phase using saline distention medium and a 5.0 mm continuous flow office hysteroscope (Karl Storz GmbH and Co., Tuttlingen, Germany) without cervical dilatation and under the general anesthesia. Prophylactic antibiotic was used to all of women. None of patients were established complication of both procedures.

Results

The mean age of the including to this study was 32 years (range 20-45). Sonohysterographic findings was not complete agreement with hysteroscopic findings in present study (sensitivity 12.8%; specificity 97.3%). Eight uterine pathology was detected in sonohysteroscopic evaluation. SHG was detected 7 (5.7%) patients endometrial polyp and 1 (0.8%) patient bicornu uterus. On the other hand, 47 uterine pathology was detected in hysteroscopic evaluation. Hysteroscopic evaluation in all of women including this study was detected 28 (22.9%) patients endometrial polyp, 10 (8.2%) patients uterine subseptum, 4 (3.2%) patients submucous myoma, 1 (0.8%) T shape uterus and 2 (1.6%) patients arcuate uterus, 2 (1.68%) adhesions patients. All of polyps and submucous myomas were excised and all of adhesions were expanded. Two women with uterine filling defects on SHG had normal endometrial cavities. Therefore, the 2.7% false positive rate and 75% positive predicitive value detected with sonohysterographic evaluation (Table 1).

Discussion

Uterine cavity pathologies may interfere with embryo implantation (1). Therefore, the evaluation of the uterine cavity is one of the basic steps in work-up of infertile women, especially before an IVF program. Traditionally, TVS, histerosalpingography (HSG), SHG and hysteroscopy have been used to diagnose uterine structural abnormalities in infertile women. In this study, we compared the efficacy of SHG to that of hysteroscopy in the screening of endometrial structural abnormalities in infertile women.

Table 1. The results of both procedures

Sono-hysterography	Hysteroscopy							
	Endometrial polyp	Submucous myoma	Synechia	Uterin subseptum	Arcuat uterus	T shape	Normal	Total
Endometrial polyp	5*	–	–	–	–	–	2	7
Bicornu Uterus	–	–	–	1	–	–	–	1
Normal	23	4	2	9	2	1	73	114
Total	28	4	2	10	2	1	75	122

*n, number of patient.

In a meta-analysis, the diagnostic accuracy of SHG was found to equal that of diagnostic hysteroscopy in the evaluation of abnormal uterine bleeding, reporting sensitivity and specificity of 95% and 88%, respectively (8). Similarly, Cepni et al. (9) reported that in premenopausal patients, SHG and hysteroscopy are equally accurate in the diagnosis of endometrial polyps and submucous fibroids. In a comparative study of SHG versus TVS with hysteroscopy in infertile patients by Ragni et al. (4), SHG yielded higher diagnostic accuracies than TVS for intrauterine pathology. Compared with hysteroscopy, the sensitivity and specificity of SHG were 98% and 94%, respectively. They proposed that a patient showing a normal uterine cavity at SHG might not require any further evaluation, avoiding an unnecessary diagnostic hysteroscopy. Hysteroscopy could be performed in doubtful diagnosis cases or when a biopsy and a histological evaluation are needed.

Yucebilgin et al. (10) compared the efficacy of SHG to that of hysteroscopy in the screening of endometrial structural pathologies in patients with a history of infertility. The sensitivity, specificity, positive and negative predictive values of SHG in the detection of structural endometrial cavity lesions were 85%, 75%, 75% and 84%, respectively. Bartkowiak et al. (11) investigated the diagnostic accuracy of SHG in the detection of intrauterine pathologies in infertile women. The SHG findings were compared to the results of hysteroscopy. Intrauterine pathologies were diagnosed in 25% of patients. SHG revealed 11 (87.5%) of 13 intrauterine pathologies finally visualized at diagnostic hysteroscopy. One submucous myoma and one endometrial polyp were not identified with SHG. The study group was, however, too limited to show statistically significant differences in diagnostic accuracy among SHG and HS.

In a prospective randomized trial, Brown et al. (12) compared the diagnostic accuracy, pain scores, and procedure length of outpatient hysteroscopy, HSG, and SHG for the evaluation of the uterine cavity. They concluded that hysteroscopy, SHG, and HSG were statistically equivalent regarding evaluation of uterine cavity pathology in infertile women. However, the average pain score (scale of 0-10) was significantly lower for SHG (2.7 for SHG vs. 5.8 for HSG and 5.3 for hysteroscopy).

SHG is inexpensive, comfortable and practical technique when compare with hysteroscopy. Another hands, when the

detection of uterine pathologies in our study, hysteroscopy was more accurate than SHG. Many authors recommend the routine use of hysteroscopy for screening before an IVF program (13-15). Routine office hysteroscopy might be reasonable for every infertile women, and prompt measures should be done when a pathology is identified.

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