

Diagnostic value of hysteroscopy and hysterosonography in endometrial abnormalities in asymptomatic postmenopausal women

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Abstract

Objective To estimate the diagnostic value of hysteroscopy and hysterosonography in endometrial pathologies in asymptomatic postmenopausal women.

Materials and methods In this prospective study, 77 asymptomatic postmenopausal women that had a suspicion of endometrial abnormalities based upon transvaginal ultrasonography were studied. The patients underwent transvaginal ultrasonography and hysterosonography. All patients then had office diagnostic hysteroscopy or operative hysteroscopy. The final diagnosis was made by operative hysteroscopy with resection and excision of the lesions or endometrial biopsy with vacuum curettage. Sensitivity, specificity, positive predictive value and negative predictive value of transvaginal ultrasonography, hysterosonography and diagnostic hysteroscopy were calculated.

Results The patients' age ranged from 45 to 80. The most common frequent abnormalities were endometrial hyperplasia in transvaginal ultrasonography (62.33%), endometrial polyp in sonohysterography (57.14%), and also endometrial polyp in diagnostic hysteroscopy (51.94%). Transvaginal ultrasonography revealed a sensitivity of 59.7% and a specificity of 35.5%. Sonohysterography revealed a sensitivity of 88.8% and a specificity of 84.4%. Diagnostic hysteroscopy revealed a sensitivity of 91% and a specificity of 82%.

Conclusion Hysterosonography showed very good agreement with hysteroscopy for the diagnosis of endometrial abnormalities in asymptomatic postmenopausal women. In asymptomatic postmenopausal women that had a suspicion of endometrial abnormalities based upon transvaginal ultrasonography should undergo both hysterosonography and hysteroscopy.

Keywords Asymptomatic postmenopausal women · Endometrial abnormalities · Hysteroscopy · Hysterosonography

Introduction

Transvaginal ultrasonography (TVUSG) is often used to evaluate the endometrium. D&C has little therapeutic effect on irregular or excessive uterine bleeding, and the technique has limitations for the diagnosis of focal endometrial lesions such as polyps submucous fibroids and adenomyosis [1]. It is now widely accepted that preoperatively, the results of TVUSG and hysterosonography may help in scheduling and planning hysteroscopic surgery, and these methods have already been proven to be more effective than the traditional D&C. Furthermore, the findings from a transvaginal scan may be used to plan the surgical procedure but there is still a need for a more detailed preoperative sonographic diagnosis (e.g., of the size and depth of attachment of submucous fibroids) [2]. A useful technique for this purpose should be highly sensitive and specific, neither time nor cost-consuming, non- or minimally invasive and cause no undue stress to the patients [3, 4].

However, in pre-, peri- and postmenopausal women taking hormone replacement therapy the diagnostic accuracy of this technique for the presence of endometrial abnormalities

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is uncertain. This limitation is especially apparent when attempts are made to distinguish between endometrial thickening and the possible presence of an intracavitary tumor. The technique of sonohysterography was developed to aid this type of diagnosis and involves the intrauterine injection of saline during TVS [5, 6]. Other authors have used this technique for accurate diagnosis of various intracavitary tumors [7, 8]. The purpose of our study is to estimate the diagnostic value of hysteroscopy and hysterosonography in endometrial pathologies in asymptomatic postmenopausal women.

Materials and methods

In this prospective study, 77 asymptomatic postmenopausal women that had a suspicion of endometrial abnormalities based upon transvaginal ultrasonography were studied. Patients diagnosed as postmenopausal had not had a menstrual period for at least 12 months.

The patients underwent transvaginal ultrasonography (TVUSG) and hysterosonography (HSG). Conventional TVUSG of the uterus was performed in both sagittal and oblique transverse planes with a 7.5-MHz probe (270 SSA-Toshiba, Toshiba Co., Tokyo, Japan). Subsequently, the vagina was disinfected with Betadine solution and a thin balloon catheter (silicon urine catheter, Rüschi, Vienna, Austria) was inserted through the cervical canal into the uterine cavity, without dilatation of the cervix or the use of local anesthesia. The uterus was visualized and 5–10 ml of 0.9% saline solution was slowly injected into the endometrial cavity. In most cases (88%), this procedure caused sufficient expansion of the cavity and hypoechogenic contrast to obtain optimal views of any abnormal structures. If not, to avoid leakage, the cervical canal was blocked by slightly expanding the balloon on the catheter. The reduction of backflow allowed adequate expansion of the cavity in most cases.

All patients then had office diagnostic hysteroscopy or operative hysteroscopy. A rigid 5-mm telescope (Karl Storz, Tuttlingen, Germany) was used with a 30° angle of view at the distal end. The endometrium was classified as abnormal [endometrial polyp, endometrial hyperplasia (without atypia), submucous myoma, atrophic endometrium, synechiae]

The final diagnosis was made by operative hysteroscopy with resection and excision of the lesions or endometrial biopsy with vacuum curettage. Sensitivity, specificity, positive predictive value and negative predictive value of transvaginal ultrasonography, hysterosonography and diagnostic hysteroscopy were calculated. The study was approved by the Ethics Committee of Fatih University Medical Faculty and was conducted in accordance with the ethical principles described by the Declaration of Helsinki. Data analysis was performed by using SPSS for Windows (version 11.5). Data were presented as mean \pm std. deviation. Sensitivity, specificity, positive predictive value and negative predictive value were calculated by using Bayesian statistics.

Results

A total of 77 patients were recruited for the study. The baseline characteristics of the 77 women who participated in the study were shown in Table 1. Table 2 shows the classification of diagnosis on TVUSG, HSG, diagnostic hysteroscopy and final diagnosis.

Table 1 Descriptive data

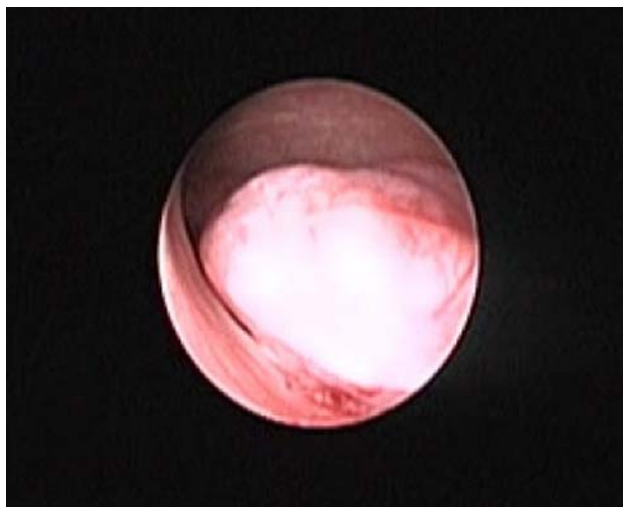
Characters	Minimum	Maximum	Mean	Std. deviation
Age (years)	45.0	80.0	60.87	8.95
Gravidity	0.00	8	3.11	2.02
Parity	0.00	7	1.96	1.21
Body mass index	23	27	25.85	1.13

Table 2 Classification of diagnosis on TVUSG, HSG, diagnostic hysteroscopy and final diagnosis

Diagnosis	Transvaginal ultrasonography		Hysterosonography		Diagnostic hysteroscopy		Final diagnosis	
	No.	%	No.	%	No.	%	No.	%
Normal cavity		29						
Abnormal cavity	77	100	48	62.33	77	100	77	100
a. Endometrial polyp	26	33.8	44	57.14	40	51.94	39	50.64
b. Endometrial hyperplasia (without atypia)	48	62.33			4	5.2	2	2.6
c. Submucous myoma	2	2.6	4	5.2	2	2.6	3	3.9
d. Atrophic endometrium					20	25.97	33	42.9
e. Synechiae					12	15.58		
Total	77	100	77	100	77	100	77	100

Table 3 Comparison of TVUSG, HSG and diagnostic hysteroscopy

	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
TVUSG	59.7	35.5	52	41
HSG	88.8	84.4	89	78.8
Diagnostic hysteroscopy	91	82	88.2	81.1

**Fig. 1** Endometrial polyp in hysteroscopy

Uterine abnormalities were present in hysterosonography (62.33%). The most common frequent abnormalities were endometrial hyperplasia in transvaginal ultrasonography (62.33%), endometrial polyp in sonohysterography (57.14%), and also endometrial polyp in diagnostic hysteroscopy (51.94%). Table 3 shows a comparison of TVUSG, HSG and diagnostic hysteroscopy. An endometrial polyp in hysteroscopy was showed in Fig. 1. Transvaginal ultrasonography revealed a sensitivity of 59.7% and a specificity of 35.5%. Sonohysterography revealed a sensitivity of 88.8% and specificity of 84.4%, whereas diagnostic hysteroscopy revealed a sensitivity of 91% and specificity of 82%.

Discussion

Irregular or abnormal uterine bleeding is a common symptom in women of all ages, and its management is a significant drain on health-care resources. The scientific basis for the use of D&C has been questioned in a number of publications [9, 10], and the availability of hysteroscopy has led to new approaches for the management of uterine bleeding disorders. It is now widely accepted that TVUSG and operative hysteroscopy combined with the histological examination of excised tissue is the most appropriate reference

**Fig. 2** Endometrial polyp in hysterosonography

technique for the assessment of endometrial pathology [11, 12]. There is still a need, however, for a more informative preoperative examination of the patient.

The TVUSG is widely used for endometrial assessment. In a recent metaanalysis involving women with postmeno-

pausal bleeding conducted by Smith-Bindman et al. [13] results indicated that a double-layer endometrial thickness greater than 5 mm was abnormal, with a sensitivity of 92% and a specificity of 81% for the detection of any endometrial disease (e.g., cancer, hyperplasia, or polyps). Hysterosonography is a useful adjunct to transvaginal USG. It enables identification of intracavitary or endoluminal lesions and can be used to determine whether an abnormality is endometrial or subendometrial. At hysterosonography, changes of adenomyosis are seen in the subendometrial inner myometrium [14]. An endometrial polyp in hysterosonography was showed in Fig. 2.

In our study, hysterosonography and diagnostic hysteroscopy had a higher specificity and sensitivity in asymptomatic postmenopausal women. Our results provide further evidence that the use of saline as a contrast agent (in sonohysterography) improves the diagnostic accuracy of TVUSG. The advantage of this method lies mainly in the diagnosis of intracavitary tumors. In particular, small intracavitary tumors, which were not detected by TVUSG, were visualized more accurately with sonohysterography. Thus, the number of false-negative findings for this type of pathology was reduced significantly. The diagnostic accuracy of conventional TVUSG for the detection of malignant and premalignant changes of the endometrium, however, was not significantly improved by sonohysterography.

In conclusion, Hysterosonography showed very good agreement with hysteroscopy for the diagnosis of endometrial abnormalities in asymptomatic postmenopausal women. In asymptomatic postmenopausal women that had a suspicion of endometrial abnormalities based upon transvaginal ultrasonography should undergo both hysterosonography and hysteroscopy.

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