COMPARATIVE STUDY OF TRANSVAGINAL ULTRASOUND AND OUTPATIENT HYSTEROscopy FOR DIAGNOSING PATHOLOGIC ENDOMETRIAL LESIONS IN POSTMENOPAUSAL WOMEN

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Study conducted at Universidade Estadual De Campinas – UNICAMP

ABSTRACT

**Objective.** To compare the effectiveness of transvaginal ultrasound and outpatient diagnostic hysteroscopy in the diagnosis of intrauterine diseases in postmenopausal women.

**Methods.** The sample consisted of 243 postmenopausal women who submitted to diagnostic hysteroscopy in the year of 2006. All the women were referred from primary healthcare units after submitting to transvaginal ultrasound to assess the endometrial cavity.

**Results.** The mean age of women was 61±9.4 years, and the mean time since entering menopause was 11±8.3 years. We observed endometrial hyperplasia and endometrial cancer in 6.6% of cases. Ultrasound presented 95.6% sensitivity, 7.4% specificity, positive predictive value of 53.3% and negative predictive value of 60%, whereas hysteroscopy presented 95.7%; 83%; 82.2% and 95.9%, respectively.

**Conclusion.** Hysteroscopy showed superior accuracy compared to ultrasound in the diagnosis of endometrial diseases.

**Keywords:** Ultrasound. Hysteroscopy. Uterine diseases.

INTRODUCTION

Transvaginal ultrasound has proved to be a non-invasive method, with good accuracy in the diagnosis of endometrial abnormalities in postmenopausal women. When the ultrasound detects an endometrial thickness over 4 or 5 mm, endometrial abnormalities such as polyps, myomas, hyperplasia, and endometrial cancer are ruled out.

In western nations, endometrial cancer is the most prevalent lower genital tract neoplasm in postmenopausal women. Vaginal bleeding is a common symptom in women with endometrial cancer. This is one of the main reasons for women to visit a gynecologist, although its most frequent causes are endometrial atrophy and benign endometrial lesions, and only 7% to 10% of cases are caused by endometrial carcinoma.

When diagnosing any alteration in the endometrial cavity, physicians must continue physical examination until they are able to rule out the diagnosis, thus ensuring benignity. For this purpose, there is a range of complementary tests, such as endometrium biopsy, curettage and diagnostic hysteroscopy.

Hysteroscopy allows for endoscopic evaluation of the uterine cavity, with the advantage of video recording, which makes it possible to obtain a second opinion. This test can be conducted in a clinic regime, and can be well tolerated without requiring anesthesia. Direct visualization of the uterine cavity allows for the diagnosis of cancer, as well as other diseases, such as polyps and submucosal myomas.

Although this is a more precise test, its access is limited to the Brazilian population, once few centers have the required technology. Some of these diseases, such as endometrial cancer, require earlier diagnosis for better prognosis. Therefore, the present study aims to evaluate, in postmenopausal women, the effectiveness of transvaginal ultrasound compared to outpatient hysteroscopy in diagnosis of these diseases in order to provide earlier treatment for patients.

**Methods**

The retrospective study was conducted under a diagnostic test design. This study was approved by the Research Committee

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and Ethics Committee at Unicamp. All outpatient diagnostic hysteroscopies performed from January to December of 2006 were surveyed, and 274 postmenopausal women were selected. From these, 18 were excluded because ultrasound results were missing from the file and 13 others were excluded because it was not viable to perform the hysteroscopy without anesthesia, due to pain or cervical stenosis. Therefore, 243 women were included in the study.

These women were referred from Primary Healthcare Units in the city of Campinas, where they had been submitted to routine ultrasonographic test to evaluate the endometrial cavity, and presented alterations in test results or bleeding following the test. The ultrasound was performed transvaginally, and evaluated the endometrial lining, uterine size and volume, and abnormalities in uterine cavity and muscles, in addition to ovaries, as required by the standards of the Brazilian Society of Radiology. Women were then submitted to outpatient diagnostic hysteroscopy, using a 4-mm, 30-degree optical system (Storz Endoscopy), without anesthesia. Carbon dioxide uterine distension was used, with an insufflator that maintains a 60 to 100 mmHg pressure in the uterine cavity.

Hysteroscopy made it possible to evaluate the type of endometrium (atrophic, proliferative, hypertrophic) and the presence of alterations such as polyp, myoma, synechiae and uterine septum, as well as foreign bodies such as intrauterine device and alterations in the shape of the uterus according to the Brazilian consensus on gynecologic videoendoscopy. Only 14 of these hysteroscopies required anesthesia, either because women could not tolerate the pain or due to cervical stenosis.

From the 125 women with a diagnosis of polyp or submucosal myoma, 118 were submitted to surgical hysteroscopy and the material was sent for pathological examination, considered a gold standard. Endometrial biopsies were carried out for all cases of suspected cancer.

The statistical analysis considered sensitivity, specificity, positive predictive value, negative predictive value and accuracy, with the pathological examination considered as gold standard. These procedures were carried out with the use of SAS version 9.1.3 considering a significant level (α) of 0.05 and power (1-β) of 0.80.

**Results**

The mean age of the women was 61 ± 9.4 years (43 to 84 years) and mean time since entering menopause was 11 years. The characteristics of these women are listed in Table 1.

Among these women, 52% suffered from hypertension, 15% suffered from diabetes, 32% had breast cancer and 26% were using tamoxifen, and 5% were undergoing hormone therapy. Most of the women who underwent outpatient diagnostic hysteroscopy were asymptomatic (76%), 23% reported vaginal bleeding (56) and 1% reported other causes (pelvic pain, IUD, mucorrhea).

The cutoff point for abnormal findings was a 5 mm endometrial thickness. In this sample, 4% of cases presented endometrial thickness below 5 mm, 47% presented endometrial thickness of 5 to 10 mm, and 33% presented endometrial thickness above 10 mm. Endometrial thickening was observed in 8% of cases (value was not reported) and in 8% of cases there was no information on endometrial lining.

From the 235 women whose ultrasound results showed alterations, 96 presented normal hysteroscopy, and from the 8 women whose ultrasound results were normal, 4 presented some alteration in diagnostic hysteroscopy. Ultrasound and diagnostic hysteroscopy findings can be found in Table 2.

Endometrial hyperplasia and endometrial cancer was observed in 6.6% of cases, and half of these were diagnosed by outpatient diagnostic hysteroscopy, through endometrium biopsy. All the women were either overweight or obese, 50% reported bleeding and 70% suffered from hypertension. Among women who underwent surgical hysteroscopy, 40% of cases were diagnosed with polyp, confirmed by pathological examination.

Ultrasound showed high sensitivity and low specificity, with accuracy of 53.7%, whereas hysteroscopy showed high sensitivity and specificity, with accuracy of 88.7%. The results of the diagnostics tests can be found in Table 3.

**Discussion**

Ultrasound has been used as a diagnostic tool for various gynecological disorders. Various studies have established correlation between endometrial thickness and the presence of intracavitary diseases in curettage material. Nevertheless, ultrasound does not allow for exact diagnosis, it is only a method which can indicate some abnormality in the uterine cavity or endometrium. We observed that, from the 235 women whose ultrasound results presented alterations, 40% showed normal hysteroscopy results. Gmur et al. have observed that, from 77 ultrasound results with alterations, 27% of hysteroscopy results were normal, and Timmermans observed that, from

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**Table 1. Characteristics of the 243 postmenopausal women who underwent ultrasound and diagnostic hysteroscopy for endometrial cavity evaluation.**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mean (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>61 (9.4)</td>
<td>43</td>
<td>84</td>
</tr>
<tr>
<td>Age at menopause</td>
<td>49 (4.7)</td>
<td>27</td>
<td>60</td>
</tr>
<tr>
<td>Time since menopause</td>
<td>11.3 (8.3)</td>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td>Gestation</td>
<td>3.7 (3.1)</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Parity</td>
<td>3.2 (2.6)</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>C-sections</td>
<td>0.4 (0.9)</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Abortions</td>
<td>0.4 (0.8)</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>BMI</td>
<td>29.8 (5.6)</td>
<td>17.5</td>
<td>49.8</td>
</tr>
</tbody>
</table>

BMI – body mass index
Comparative study of transvaginal ultrasound and outpatient hysteroscopy for diagnosing pathologic endometrial lesions in postmenopausal women

In our study, ultrasound showed lower accuracy compared to hysteroscopy (53.7% and 88.7%, respectively) for the diagnosis of intrauterine pathologies in these women. The literature also offers similar results, in which hysteroscopy shows higher accuracy than ultrasound.15-17

We observed that ultrasound presented a 95.6% sensitivity and a 7.4 specificity, whereas hysteroscopy showed a 95.7 sensitivity and 83% specificity for the diagnosis of intrauterine diseases.

The study noted that both methods present high sensitivity, however hysteroscopy is significantly more specific than ultrasound. In women with postmenopausal bleeding, studies have also shown lower specificity for ultrasound. A study with 419 women has shown a 95.1% sensitivity and 54.8% specificity for ultrasound compared to 96.5% and 93.6% for a hysteroscopy.17

Another study has shown that ultrasound presented a 100% sensitivity and 75% specificity while hysteroscopy presented 97% sensitivity and 88% specificity.1 Cacciatore has found a sensitivity of 86.9% and a specificity of 91.7% for ultrasound diagnosis for intrauterine diseases, versus a sensitivity of 73.9% and specificity of 95.7% for diagnostic hysteroscopy.20

In 752 women with postmenopausal bleeding, ultrasound has shown 89% sensitivity and 86% specificity, while hysteroscopy has shown 98% sensitivity and 91% specificity.15

For the present study we observed 3% of endometrial cancer cases, 3.6% endometrial hyperplasia and 54% endometrial polyp. In the literature, these percentages are consistent with our findings. Cepni has observed 55% endometrial polyp, 2% endometrial cancer and 7% endometrial hyperplasia in his sample, while the percentages found by Angioni were 41%, 4.7% and 18%, respectively, and a study by Mattinger, in turn, found values of 79%, 3% and 6.5%.6,19,21 A systematic review that analyzed 65 studies with 26346 women, observed 3.9% of endometrial cancer cases.22 All women with endometrial cancer in our study presented endometrial lining above 5 mm. A metanalysis with 35 studies (5892 women) showed that 96% of women with endometrial cancer presented endometrial lining thickness above 5 mm.23

### Table 2. Results found in ultrasound and diagnostic hysteroscopy of menopausal women.

<table>
<thead>
<tr>
<th>Ultrasound diagnosis</th>
<th>Diagnostic</th>
<th>Hysteroscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (%)</td>
<td>Polyp (%)</td>
</tr>
<tr>
<td>Endometrial thickening</td>
<td>90 (37,3)</td>
<td>111 (45,7)</td>
</tr>
<tr>
<td>Polyp</td>
<td>5 (2)</td>
<td>13 (5,4)</td>
</tr>
<tr>
<td>Intramural myoma</td>
<td>0</td>
<td>1 (0,4)</td>
</tr>
<tr>
<td>Thickening and polyp</td>
<td>1 (0,4)</td>
<td>4 (1,6)</td>
</tr>
<tr>
<td>Normal</td>
<td>4 (1,6)</td>
<td>2 (0,8)</td>
</tr>
</tbody>
</table>

### Table 3. Diagnostic indices found in ultrasound and hysteroscopy in menopausal women.

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Ultrasound (CI 95%)</th>
<th>Hysteroscopy (CI 95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>95,6 (90,6-98,4)</td>
<td>95,7 (90,2-98,6)</td>
</tr>
<tr>
<td>Specificity</td>
<td>7,4 (3,4-13,5)</td>
<td>83,0 (75,7-88,8)</td>
</tr>
<tr>
<td>PPV</td>
<td>53,3 (46,8-59,7)</td>
<td>82,2 (74,7-88,3)</td>
</tr>
<tr>
<td>NPV</td>
<td>60,0 (32,3-83,7)</td>
<td>95,9 (90,7-98,7)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>53,7 (32,3-83,7)</td>
<td>88,7 (90,7-98,7)</td>
</tr>
</tbody>
</table>

CI – confidence interval, PPV – positive predictive value, NPV – negative predictive value.
CONCLUSION

This study concluded that hysteroscopy showed superior accuracy compared to ultrasound in the diagnosis of endometrial diseases.

No conflict of interest declared concerning the publication of this article.

REFERENCES


