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Observational Study

Pathological pattern of endometrial abnormalities in postmenopausal women with bleeding or thickened endometrium

Hui Xue, Wen-Jing Shen, Yi Zhang

**Abstract**

**BACKGROUND**

Postmenopausal bleeding and an endometrial thickness ≥ 5 mm on sonograms of menopausal women can indicate the presence of endometrial lesions. Diagnostic hysteroscopy is a powerful method for endometrial diseases.

**AIM**

To investigate the pathological pattern of endometrial abnormalities in postmenopausal women with bleeding or asymptomatic thickened endometrium diagnosed by hysteroscopy.

**METHODS**

A total of 187 postmenopausal women with bleeding or asymptomatic thickened endometrium underwent diagnostic hysteroscopy. The women were subsequently divided into three groups: Postmenopausal bleeding (PMB) group (n = 84), asymptomatic group (n = 94), and additional group (n = 9). Women in the additional group manifested abdominal pain and leukorrhagia.

**RESULTS**

Among the 187 patients examined, 84 (44.9%) were diagnosed with PMB and 94 (50.3%) with asymptomatic thickened endometrium. Endometrial polyp was the most common endometrial abnormality, which was detected in 51.2%, 76.6% and 77.8% of the PMB, asymptomatic, and additional groups, respectively. Fewer malignant lesions were detected in the asymptomatic group. Endometrial hyperplasia without atypia was found in 8.3% of the PMB group and 7.4% of the asymptomatic group.

**CONCLUSION**

Endometrial polyp was the most common pathology in the PMB group. Diagnostic hysteroscopy is recommended for women with PMB and asympto-
tomatic thickened endometrium.

**Key Words:** Endometrium; Polyps; Postmenopause; Hysteroscopy; Adenocarcinoma

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**Core Tip:** Postmenopausal bleeding and thickened endometrium in menopausal women indicate the presence of endometrial lesions. These women should undergo further examination to rule out malignancy. In particular, diagnostic hysteroscopy is recommended based on its lower cost, lower rate of complications, and high accuracy.

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**INTRODUCTION**

Postmenopausal bleeding (PMB) is a common symptom and complaint in women visiting the gynecological clinic. In some cases, PMB can indicate the presence of endometrial lesions, including endometrial polyps, myomas, or endometrial hyperplasia. Approximately 10% of women with PMB have endometrial cancer[1,2]. In addition, completely asymptomatic women may also be referred to clinics for an abnormal endometrium. Generally, an endometrial thickness ≥ 5 mm on sonogram of menopausal women is associated with a high risk of endometrial malignancy[3,4].

The observed patterns of endometrial pathology in postmenopausal women with endometrial abnormalities have been inconsistent due to differences in examination methods and populations examined. Consequently, there is no consensus regarding clinical management of increased endometrial thickness in postmenopausal women. In the present study, the pathological pattern of endometrial abnormalities in postmenopausal women with PMB or asymptomatic thickened endometrium established by diagnostic hysteroscopy and pathological diagnosis were retrospectively analyzed in order to provide evidence-based management of future cases.

**MATERIALS AND METHODS**

**Study population and data collection**

A total of 192 postmenopausal women who presented with PMB or an abnormal endometrial echo ≥ 5 mm on transvaginal ultrasound (TVS) between January 2017 and December 2018 at the Department of Gynecology, First Affiliated Hospital of China Medical University were retrospectively analyzed. Endometrial thickness was measured in the longitudinal plane at its thickest point. Layers of both endometrium and myometrium were included and measured from the inner edges of the anterior and posterior walls of the uterus, including the uterine cavity.

Menopause was defined as an absence of menstrual periods for more than 12 mo. None of the women in this study received hormone replacement therapy or tamoxifen as treatment for breast cancer. Furthermore, none of them had a history of cancer of the genital tract.

All the women underwent a diagnostic hysteroscopy and endometrium biopsy after providing written informed consent. Five women were excluded because of cervical stenosis and adhesion. The remaining 187 patients were divided into three groups: PMB group (n = 84), asymptomatic group (n = 94), and additional group (n = 9). The additional group included patients with abdominal pain and leukorrhagia.

Hysteroscopies were conducted in an outpatient setting with a 3.5-mm hysteroscope and a 30° view by the same examiner. The media used was normal saline and each hysteroscopy was performed under total intravenous anesthesia. The entire uterine cavity was precisely and systematically evaluated. All the findings were recorded accurately. Endometrial biopsy was obtained from all the participants. Biopsy samples were immediately placed in 10% formaldehyde and sent to a pathology laboratory. The pathologist was blinded to the hysteroscopic findings. Histological findings were classified as abnormal when endometrial polyp, submucous myoma, endometritis, adenomyosis, endometrial hyperplasia, or endometrial cancer were detected.
Statistical analysis
Pathological findings in each group and the percentage values for each pattern were analyzed and compared. The predictive value of diagnostic hysteroscopy for endometrial lesions was assessed based on sensitivity, specificity, and negative predictive value (NPV) and positive predictive value (PPV).

RESULTS
A total of 187 women with PMB or asymptomatic abnormal endometria were retrospectively evaluated. Their mean age was 55.2 ± 7.6 years (range: 41-79 years). Among the patients who underwent a hysteroscopic examination, 44.9% (84/187) had PMB, while 50.3% (94/187) were asymptomatic. The remaining patients (4.8%, 9/187) presented with abdominal pain and leukorrhagia. All of the participating patients underwent both hysteroscopy and endometrial biopsy. The latter was confirmed with histology. No complications were recorded during either evaluation.

Among the patients in the PMB, asymptomatic, and additional groups, endometrial polyp was the most common endometrial abnormality detected (51.2%, 76.6%, and 77.8%, respectively) (Table 1). For the women with PMB, malignant lesions were the second most common endometrial pathology observed. There were 7 (8.3%) cases of hyperplasia with atypia and 14 (16.7%) cases of endometrial adenocarcinoma. The number of malignant lesions was markedly lower in the asymptomatic group, with only 2 (2.1%) cases of hyperplasia with atypia and 1 (1.1%) case of endometrial adenocarcinoma.

Endometrial hyperplasia is common in postmenopausal women with endometrial abnormalities. In our cohort, 8.3% of the women in the PMB group and 7.4% in the asymptomatic group had hyperplasia without atypia. Notably, five patients were pathologically diagnosed with polypoid adenomyoma, three were diagnosed with polypoid adenomyoma without atypia, and two patients were diagnosed with atypia (Table 2).

A higher diagnostic accuracy was achieved with hysteroscopy for endometritis and submucosal myoma, with sensitivity, specificity, PPV and NPV being 100%. The sensitivity, specificity, PPV and NPV of hysteroscopy for detecting polyps were 97.5%, 70.8%, 86.2%, and 93.9%, respectively. For diagnosing cancer, the specificity and PPV of hysteroscopy were both 100%, while sensitivity was 93.3% and NPV was 99.4% (Table 3).

DISCUSSION
The number of menopausal women has increased in recent years worldwide due to improvements in quality of life.[5] Bleeding is one of the most common complaints by menopausal women at gynecological clinics. With development of TVS, thickened endometria have been found coincidentally. It has been reported that 7%-12% of gynecologically healthy and asymptomatic postmenopausal women have an endometrial thickness ≥ 5.0 mm on sonogram.[6-8] It has been hypothesized that PMB or a thickened endometrium may indicate an increased risk of certain endometrial pathologies such as endometrial hyperplasia, polyps, or endometrial cancer.[9-13]

Both dilation and curettage (D&C) and hysteroscopy are frequently performed for a histological diagnosis of PMB or asymptomatic thickened endometrium in women. However, the diagnostic results vary with different types of endometrial sampling. For example, Deeba et al.[14] reported that the most common histological pattern detected in women with PMB by endometrial biopsy with D&C is complex hyperplasia without atypia, followed by atrophic endometrium, simple hyperplasia, and malignancy. When the same examination was performed among postmenopausal women in India, Doraiswami et al.[15] observed that the most frequent histological pattern was normal endometrium, followed by malignancy, complex hyperplasia without atypia, benign endometrial polyp, simple hyperplasia, atrophic endometrium, and endometritis. However, different endometrial histological patterns have been reported by hysteroscopy. For example, the most common histological pattern observed in 295 asymptomatic postmenopausal patients with thickened endometrium was polyps (67.1%), followed by atrophy, simple hyperplasia, submucous myoma, atypical hyperplasia, and endometrial cancer in a report by Trojano et al.[16]. Sarvi et al.[17] observed that endometrial polyps were the most frequently identified pattern by hysteroscopy in both PMB and asymptomatic patients with thickened endometrium. In the present study, among 84 women with PMB, the most common endometrial abnormalities included polyps (51.2%), followed by endometrial cancer (16.7%), hyperplasia without atypia (8.3%), hyperplasia with atypia (8.3%), and endometritis (7.1%). Among the 94 asymptomatic postmenopausal patients with thickened endometrium, the same types of endometrial abnormalities were observed, in addition to endometrial cancer (1.1%). Among the asymptomatic group, polyps (76.6%), hyperplasia without atypia (7.4%), and endometritis (6.4%) were observed. Thus, endometrial polyps were found to be the most common endometrial lesions in both PMB patients and asymptomatic postmenopausal patients with thickened endometrium in the present study. Vaginal bleeding is a common presentation, and endometrial polyps may also be asymptomatic, and incidentally detected by
Table 1 Endometrial pathology pattern in the postmenopausal women

<table>
<thead>
<tr>
<th>Group</th>
<th>Endometritis</th>
<th>Polyps</th>
<th>Hyperplasia</th>
<th>Myoma</th>
<th>Polypoid adenomyoma</th>
<th>Cancer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Without atypia</td>
<td>With atypia</td>
<td>Without atypia</td>
<td>With atypia</td>
<td></td>
</tr>
<tr>
<td>PMB, n (%)</td>
<td>6 (7.1)</td>
<td>43 (51.2)</td>
<td>7 (8.3)</td>
<td>7 (8.3)</td>
<td>5 (6.0)</td>
<td>1 (1.2)</td>
<td>1 (1.2)</td>
</tr>
<tr>
<td>Asymptomatic, n (%)</td>
<td>6 (6.4)</td>
<td>72 (76.6)</td>
<td>7 (7.4)</td>
<td>2 (2.1)</td>
<td>3 (3.2)</td>
<td>2 (2.1)</td>
<td>1 (1.1)</td>
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<tr>
<td>Additional</td>
<td>1</td>
<td>7 (77.8)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total, n (%)</td>
<td>13 (7.0)</td>
<td>122 (65.2)</td>
<td>14 (7.5)</td>
<td>9 (4.8)</td>
<td>9 (4.8)</td>
<td>3 (1.6)</td>
<td>2 (1.1)</td>
</tr>
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</table>

PMB: Postmenopausal bleeding.

Table 2 Comparison of hysteroscopy and histopathologic findings

<table>
<thead>
<tr>
<th>Hysteroscopy</th>
<th>Histopathology</th>
<th>Hyperplasia</th>
<th>Myoma</th>
<th>Polypoid adenomyoma</th>
<th>Cancer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>With atypia</td>
<td>Without atypia</td>
<td>With atypia</td>
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</tr>
<tr>
<td>Endometritis</td>
<td>13</td>
<td>13</td>
<td></td>
<td>1</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Polyps</td>
<td>119</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Hyperplasia</td>
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<td>8</td>
<td>2</td>
<td>9</td>
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<tr>
<td>Myoma</td>
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<tr>
<td>Cancer</td>
<td></td>
<td></td>
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<td>14</td>
<td>14</td>
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<tr>
<td>Total</td>
<td>13</td>
<td>122</td>
<td>14</td>
<td>9</td>
<td>9</td>
<td>3</td>
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</table>

Table 3 Sensitivity, specificity, positive predictive value and negative predictive value of hysteroscopy

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>PPV (%)</th>
<th>NPV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endometritis</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Polyps</td>
<td>97.5</td>
<td>70.8</td>
<td>86.2</td>
<td>93.9</td>
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<tr>
<td>Hyperplasia</td>
<td>43.5</td>
<td>98.2</td>
<td>77.0</td>
<td>92.5</td>
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<tr>
<td>Myoma</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Cancer</td>
<td>93.3</td>
<td>100</td>
<td>100</td>
<td>99.4</td>
</tr>
</tbody>
</table>

PPV: Positive predictive value; NPV: Negative predictive value.

Currently, there is no consensus nor guidelines regarding treatment of postmenopausal endometrial polyps[19,20]. Aston et al[21] have reported that endometrium polyps are benign lesions which are most frequently detected in asymptomatic postmenopausal women, and suggested that routine practice of D&C in asymptomatic postmenopausal women should be re-evaluated. Bel et al[22] reported that malignancy was detected in 30/631 (4.75%) patients diagnosed with polyps by ultrasonography or diagnostic hysteroscopy prior to surgery. Furthermore, Elfayomy et al[23] demonstrated that approximately 20% of polyps subjected to biopsy had malignant components hidden in their stem or center despite exhibiting normal endometrial pathology.

A meta-analysis of primarily retrospective studies has shown that the prevalence of premalignant or malignant polyps was 5.42% (214/3946) among postmenopausal women diagnosed with endometrial polyps, and was 1.7% (68/3997) in reproductive-aged women[24]. Endometrial polyps in symptomatic postmenopausal women have also exhibited a higher malignant rate than those present in asymptomatic postmenopausal women[24]. In the present study, 5.8% (8/138) of women who underwent hysteroscopy were diagnosed with premalignant or malignant polyps, including hyperplasia with atypia (n = 7) and cancer (n = 1). Based on these data, both PMB and postmenopausal status in women with endometrial polyps represent conditions associated with an increased risk of endometrial malignancy. Therefore, we recommend that menopausal women with endometrial polyps
should undergo further examination and management. Korkmazer et al.[25] found that 22.3% of endometrial polyps and 47% of submucosal fibroids were misdiagnosed by D&C in 93 post-menopausal women with increased endometrial thickness. Similarly, Lee et al.[26] showed that among 112 PMB women, 36/39 (92.3%) cases of endometrial polyps and 1/2 (50%) cases of endometrial cancer were misdiagnosed by curettage. Therefore, the authors concluded that biopsy by curettage may not be reliable for evaluating endometrial pathology. Based on the present data, we suggest that intrauterine examination and endometrial biopsy under direct vision should be performed in all patients with abnormal manifestations in order to ensure that malignant pathology is not missed.

Diagnostic hysteroscopy is a powerful method for endometrial diseases because it provides a direct view of the uterine cavity and a biopsy is performed where endometrial lesions are localized. Hysteroscopy is also more accurate than simple D&C. In the present study, diagnostic hysteroscopy showed a relatively high sensitivity, specificity, PPV and NPV for benign and malignant endometrial lesions, and these results are consistent with those of other studies.[27,28]

However, despite a high accuracy in diagnosis, there is no consensus regarding hysteroscopy for endometrial diagnosis because of the cost associated with this method[21,29] and the risks of surgical complications (e.g., uterine perforation, bowel damage, excessive fluid absorption, anesthetic complications)[30]. In the present study, hysteroscopies were performed in the women in a clinical setting without hospitalization, and this reduced the cost of the patients. In addition, the duration of examination (5-10 min) was not associated with any obvious complications. Therefore, we recommend diagnostic hysteroscopy for women with PMB or asymptomatic thickened endometrium to prevent a missed diagnosis.

The limitation of this study is that the subjects involved are all outpatients with good physical condition and fewer comorbidities. For elderly postmenopausal women with severe complications, the security of diagnostic hysteroscopy should be further studied.

CONCLUSION
Endometrial polyp is the most common pathology in postmenopausal women, and it has malignant potential especially in women experiencing PMB. Our results support intracavity detection with diagnostic hysteroscopy for women with PMB to confirm the nature of lesions and to rule out malignancy. Generally, asymptomatic women with incidental thickened endometrium have a lower incidence of malignancy. However, because of the lower cost, lower rate of complications, and higher accuracy, diagnostic hysteroscopy is recommended for these women.

ARTICLE HIGHLIGHTS

Research background
Postmenopausal bleeding and incidental thickened endometrium are common in postmenopausal women, but there are few studies about the patterns of endometrial pathology in postmenopausal women with endometrial abnormalities.

Research motivation
To analyze the patterns of endometrial pathology in postmenopausal women with endometrial abnormalities.

Research objectives
The patterns of postmenopausal endometrial lesions were statistically analyzed by using a large sample size.

Research methods
A total of 187 postmenopausal women with bleeding or asymptomatic thickened endometrium underwent diagnostic hysteroscopy and endometrium biopsy. Their endometrial pathologic types were analyzed retrospectively.

Research results
Endometrial polyp was the most common endometrial abnormality in postmenopausal women with bleeding or asymptomatic thickened endometrium. Fewer malignant lesions were detected in the asymptomatic group.
Research conclusions
Endometrial polyp was the most common pathology in postmenopausal women with bleeding or asymptomatic thickened endometrium.

Research perspectives
Diagnostic hysteroscopy is recommended for postmenopausal women with bleeding or asymptomatic thickened endometrium.

FOOTNOTES

Author contributions: Zhang Y designed the study; Xue H and Shen WJ performed in the data acquisition and analysis, drafted and revised the manuscript; all authors have read and approved the final manuscript to be submitted.

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