ISSN 2307-8960 (online)

World Journal of *Clinical Cases*

World J Clin Cases 2022 March 6; 10(7): 2053-2361

Published by Baishideng Publishing Group Inc

World Journal of Clinical Cases

Contents

Thrice Monthly Volume 10 Number 7 March 6, 2022

FIELD OF VISION

MINIREVIEWS

ORIGINAL ARTICLE

Clinical and Translational Research

Case Control Study

Retrospective Study

Clinical Trials Study

World Journal of Clinical Cases

Thrice Monthly Volume 10 Number 7 March 6, 2022

Contents

World Journal of Clinical Cases

Thrice Monthly Volume 10 Number 7 March 6, 2022

Contents

Contents

Thrice Monthly Volume 10 Number 7 March 6, 2022

NAME OF JOURNAL
World Journal of Clinical Cases

ISSN
ISSN 2307-8960 (online)

LAUNCH DATE
April 16, 2013

FREQUENCY
Thrice Monthly

EDITORS-IN-CHIEF
Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku

EDITORIAL BOARD MEMBERS
https://www.wjgnet.com/2307-8960/editorialboard.htm

PUBLICATION DATE
March 6, 2022

COPYRIGHT
© 2022 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS
https://www.wjgnet.com/bpg/GerInfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/GerInfo/288

PUBLICATION MISCONDUCT
https://www.wjgnet.com/bpg/gerinfo/208

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/gerinfo/242

STEPS FOR SUBMITTING MANUSCRIPTS
https://www.wjgnet.com/bpg/GerInfo/239

ONLINE SUBMISSION
https://www.f6publishing.com

World Journal of Clinical Cases

Submit a Manuscript: https://www.f6publishing.com

World J Clin Cases 2022 March 6; 10(7): 2159-2165

DOI: 10.12998/wjcc.v10.i7.2159

ISSN 2307-8960 (online)

ORIGINAL ARTICLE

Observational Study

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

Hui Xue, Wen-Jing Shen, Yi Zhang

Specialty type: Obstetrics and gynecology

Provenance and peer review: Unsolicited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): C
Grade D (Fair): 0
Grade E (Poor): 0

P-Reviewer: Saragoni L

Received: August 6, 2021
Peer-review started: August 6, 2021
First decision: September 1, 2021
Revised: September 11, 2021
Accepted: January 17, 2022
Article in press: January 17, 2022
Published online: March 6, 2022

Hui Xue, Wen-Jing Shen, Yi Zhang, Department of Gynecology, The First Affiliated Hospital of China Medical University, Shenyang 110001, Liaoning Province, China

Corresponding author: Yi Zhang, MD, PhD, Chief Doctor, Department of Gynecology, The First Affiliated Hospital of China Medical University, No. 155 North Nanjing Street, Shenyang 110001, Liaoning Province, China. syzi@163.com

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. In the PMB group, 7 (8.3%) women had hyperplasia with atypia and 14 (16.7%) had endometrial adenocarcinoma. 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 asymp-

tomatic thickened endometrium.

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

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.

Citation: Xue H, Shen WJ, Zhang Y. Pathological pattern of endometrial abnormalities in postmenopausal women with bleeding or thickened endometrium. *World J Clin Cases* 2022; 10(7): 2159-2165
URL: https://www.wjgnet.com/2307-8960/full/v10/i7/2159.htm
DOI: https://dx.doi.org/10.12998/wjcc.v10.i7.2159

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 (67.11%), 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

Group	Endometritis	Polyps	Hyperplasia		Myoma	Polypoid adenomyoma		Cancer	Total
			Without atypia	With atypia		Without atypia	With atypia		
PMB, *n* (%)	6 (7.1)	43 (51.2)	7 (8.3)	7 (8.3)	5 (6.0)	1 (1.2)	1 (1.2)	14 (16.7)	84 (44.9)
Asymptomatic, *n* (%)	6 (6.4)	72 (76.6)	7 (7.4)	2 (2.1)	3 (3.2)	2 (2.1)	1 (1.1)	1 (1.1)	94 (50.3)
Additional	1	7 (77.8%)	0	0	1	0	0	0	9 (4.8%)
Total, *n* (%)	13 (7.0)	122 (65.2)	14 (7.5)	9 (4.8)	9 (4.8)	3 (1.6)	2 (1.1)	15 (7.5)	187

PMB: Postmenopausal bleeding.

Table 2 Comparison of hysteroscopy and histopathologic findings

Hysteroscopy	Histopathology								
	Endometritis	Polyps	Hyperplasia		Myoma	Polypoid adenomyoma		Cancer	Total
			Without atypia	With atypia		Without atypia	With atypia		
Endometritis	13								13
Polyps		119	6	7		3	2	1	138
Hyperplasia		3	8	2					13
Myoma					9				9
Cancer								14	14
Total	13	122	14	9	9	3	2	15	187

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

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Endometritis	100	100	100	100
Polyps	97.5	70.8	86.2	93.9
Hyperplasia	43.5	98.2	77.0	92.5
Myoma	100	100	100	100
Cancer	93.3	100	100	99.4

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

TVS for other conditions[18].

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 pothologic 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.

Supported by Key Research and Development Project in Department of Science and Technology, Liaoning Province, No. 2017225025.

Institutional review board statement: This study was reviewed and approved by the Science and Research Office of First Affiliated Hospital of China Medical University (Shenyang, China).

Informed consent statement: All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

Conflict-of-interest statement: There are no conflicts of interest to report.

Data sharing statement: No additional data are available.

STROBE statement: The authors have read the STROBE Statement—checklist of items and the manuscript was prepared and revised accordingly.

Country/Territory of origin: China

ORCID number: Hui Xue 0000-0002-9042-4215; Wen-Jing Shen 0000-0002-6672-3426; Yi Zhang 0000-0001-5875-6108.

S-Editor: Yan JP
L-Editor: A
P-Editor: Yan JP

REFERENCES

1 **Otify M**, Fuller J, Ross J, Shaikh H, Johns J. Endometrial pathology in the postmenopausal woman- an evidence based approach to management. *Obstet Gynaecol* 2015; **17**: 29-38 [DOI: 10.1111/tog.12150]
2 **van Hanegem N**, Breijer MC, Slockers SA, Zafarmand MH, Geomini P, Catshoek R, Pijnenborg J, van der Voet LF, Dijkhuizen F, van Hoecke G, Reesink-Peters N, Veersema S, van Hooff M, van Kesteren P, Huirne JA, Opmeer BC, Bongers MY, Mol B, Timmermans A. Diagnostic workup for postmenopausal bleeding: a randomised controlled trial. *BJOG* 2017; **124**: 231-240 [PMID: 27225535 DOI: 10.1111/1471-0528.14126]
3 **Timmermans A**, Opmeer BC, Khan KS, Bachmann LM, Epstein E, Clark TJ, Gupta JK, Bakour SH, van den Bosch T, van Doorn HC, Cameron ST, Giusa MG, Dessole S, Dijkhuizen FPHLJ, Ter Riet G, Mol BWJ. Endometrial thickness measurement for detecting endometrial cancer in women with postmenopausal bleeding: a systematic review and meta-analysis. *Obstet Gynecol* 2010; **116**: 160-167 [PMID: 20567183 DOI: 10.1097/AOG.0b013e3181e3e7e8]
4 **Patel V**, Wilkinson EJ, Chamala S, Lu X, Castagno J, Rush D. Endometrial Thickness as Measured by Transvaginal Ultrasound and the Corresponding Histopathologic Diagnosis in Women With Postmenopausal Bleeding. *Int J Gynecol Pathol* 2017; **36**: 348-355 [PMID: 27801761 DOI: 10.1097/PGP.0000000000000344]
5 **Ko SH**, Kim HS. Menopause-Associated Lipid Metabolic Disorders and Foods Beneficial for Postmenopausal Women. *Nutrients* 2020; **12** [PMID: 31941004 DOI: 10.3390/nu12010202]
6 **Sladkevicius P**, Valentin L, Marsàl K. Transvaginal gray-scale and Doppler ultrasound examinations of the uterus and ovaries in healthy postmenopausal women. *Ultrasound Obstet Gynecol* 1995; **6**: 81-90 [PMID: 8535922 DOI: 10.1046/j.1469-0705.1995.06020081.x]

7 **Andolf E**, Dahlander K, Aspenberg P. Ultrasonic thickness of the endometrium correlated to body weight in asymptomatic postmenopausal women. *Obstet Gynecol* 1993; **82**: 936-940 [PMID: 8233268 DOI: 10.1016/0378-5122(93)90031-C]

8 **Jokubkiene L**, Sladkevicius P, Valentin L. Transvaginal ultrasound examination of the endometrium in postmenopausal women without vaginal bleeding. *Ultrasound Obstet Gynecol* 2016; **48**: 390-396 [PMID: 26678251 DOI: 10.1002/uog.15841]

9 **Clarke MA**, Long BJ, Del Mar Morillo A, Arbyn M, Bakkum-Gamez JN, Wentzensen N. Association of Endometrial Cancer Risk With Postmenopausal Bleeding in Women: A Systematic Review and Meta-analysis. *JAMA Intern Med* 2018; **178**: 1210-1222 [PMID: 30083701 DOI: 10.1001/jamainternmed.2018.2820]

10 **Li Z**, Li L. Risk of malignancies among asymptomatic postmenopausal women with thickened endometrium: A cohort study. *Medicine (Baltimore)* 2019; **98**: e14464 [PMID: 30732213 DOI: 10.1097/MD.0000000000014464]

11 **Kim H**, Hur C. A Prospective Comparison of the Biopsy Results from Curettage and Hysteroscopy in Postmenopausal Uterine Bleeding. *J Minim Invasive Gynecol* 2015; **22**: S186 [PMID: 27678985 DOI: 10.1016/j.jmig.2015.08.681]

12 **Manchanda R**, Thapa S. An overview of the main intrauterine pathologies in the postmenopausal period. *Climacteric* 2020; **23**: 384-387 [PMID: 32520598 DOI: 10.1080/13697137.2020.1776694]

13 **Famuyide AO**, Breitkopf DM, Hopkins MR, Laughlin-Tommaso SK. Asymptomatic thickened endometrium in postmenopausal women: malignancy risk. *J Minim Invasive Gynecol* 2014; **21**: 782-786 [PMID: 24632398 DOI: 10.1016/j.jmig.2014.03.004]

14 **Deeba F**, Shaista, Khan B. Histological Pattern Of Endometrial Samples In Postmenopausal Women With Abnormal Uterine Bleeding. *J Ayub Med Coll Abbottabad* 2016; **28**: 721-724 [PMID: 28586596]

15 **Doraiswami S**, Johnson T, Rao S, Rajkumar A, Vijayaraghavan J, Panicker VK. Study of endometrial pathology in abnormal uterine bleeding. *J Obstet Gynaecol India* 2011; **61**: 426-430 [PMID: 22851826 DOI: 10.1007/s13224-011-0047-2]

16 **Trojano G**, Damiani GR, Casavola VC, Loiacono R, Malvasi A, Pellegrino A, Siciliano V, Cicinelli E, Salerno MG, Battini L. The Role of Hysteroscopy in Evaluating Postmenopausal Asymptomatic Women with Thickened Endometrium. *Gynecol Minim Invasive Ther* 2018; **7**: 6-9 [PMID: 30254927 DOI: 10.4103/GMIT.GMIT_10_17]

17 **Sarvi F**, Alleyassin A, Aghahosseini M, Ghasemi M, Gity S. Hysteroscopy: A necessary method for detecting uterine pathologies in post-menopausal women with abnormal uterine bleeding or increased endometrial thickness. *Turk J Obstet Gynecol* 2016; **13**: 183-188 [PMID: 28913119 DOI: 10.4274/tjod.66674]

18 **Clark TJ**, Stevenson H. Endometrial Polyps and Abnormal Uterine Bleeding (AUB-P): What is the relationship, how are they diagnosed and how are they treated? *Best Pract Res Clin Obstet Gynaecol* 2017; **40**: 89-104 [PMID: 27914969 DOI: 10.1016/j.bpobgyn.2016.09.005]

19 **Nijkang NP**, Anderson L, Markham R, Manconi F. Endometrial polyps: Pathogenesis, sequelae and treatment. *SAGE Open Med* 2019; **7**: 2050312119848247 [PMID: 31105939 DOI: 10.1177/2050312119848247]

20 **Soja M**, Masternak M, Piwowarczyk I, Janas Ł, Szyłło K, Nowak M. Analysis of the results of invasive diagnostic procedures in patients referred to gynecologic department due to abnormal uterine bleeding. *Prz Menopauzalny* 2020; **19**: 155-159 [PMID: 33488325 DOI: 10.5114/pm.2020.101942]

21 **Aston B**, Weaver E. Risks and benefits of hysteroscopy and endometrial sampling as a standard procedure for assessing serendipitous findings of endometrial thickening in postmenopausal women. *Aust N Z J Obstet Gynaecol* 2014; **54**: 597-599 [PMID: 25308710 DOI: 10.1111/ajo.12259]

22 **Bel S**, Billard C, Godet J, Viviani V, Akladios C, Host A, Faller E, Boisrame T, Hummel M, Baldauf JJ, Lecointre L, Garbin O. Risk of malignancy on suspicion of polyps in menopausal women. *Eur J Obstet Gynecol Reprod Biol* 2017; **216**: 138-142 [PMID: 28763739 DOI: 10.1016/j.ejogrb.2017.07.013]

23 **Elfayomy AK**, Habib FA, Elkablawy MA. Role of hysteroscopy in the detection of endometrial pathologies in women presenting with postmenopausal bleeding and thickened endometrium. *Arch Gynecol Obstet* 2012; **285**: 839-843 [PMID: 21870067 DOI: 10.1007/s00404-011-2068-6]

24 **Lee SC**, Kaunitz AM, Sanchez-Ramos L, Rhatigan RM. The oncogenic potential of endometrial polyps: a systematic review and meta-analysis. *Obstet Gynecol* 2010; **116**: 1197-1205 [PMID: 20966706 DOI: 10.1097/AOG.0b013e3181f74864]

25 **Korkmazer E**, Solak N, Üstünyurt E. Hysteroscopic assessment of postmenopausal endometrial thickening. *Prz Menopauzalny* 2014; **13**: 330-333 [PMID: 26327874 DOI: 10.5114/pm.2014.47985]

26 **Lee DO**, Jung MH, Kim HY. Prospective comparison of biopsy results from curettage and hysteroscopy in postmenopausal uterine bleeding. *J Obstet Gynaecol Res* 2011; **37**: 1423-1426 [PMID: 21651668 DOI: 10.1111/j.1447-0756.2011.01558.x]

27 **Issat T**, Beta J, Nowicka MA, Jakimiuk AJ. Accuracy and diagnostic value of outpatient hysteroscopy for malign and benign disease. *Eur J Gynaecol Oncol* 2014; **35**: 52-55 [PMID: 24654462 DOI: 10.12892/ejgo23692014]

28 **Gan DE**, Jawan RA, Moy FM. Concordance between hysteroscopic impression and endometrial histopathological diagnosis. *Prev Med* 2013; **57** Suppl: S21-S23 [PMID: 23313791 DOI: 10.1016/j.ypmed.2012.12.026]

29 **Tehranian A**, Bayani L, Heidary S, Rastad H, Rahimi A, Hosseini L. Diagnostic accuracy of sonohysterography compared to endometrial biopsy in pre-menopausal women with abnormal uterine bleeding. *Med J Islam Repub Iran* 2015; **29**: 201 [PMID: 26157719]

30 **Breijer MC**, van Hanegem N, Visser NC, Verheijen RH, Mol BW, Pijnenborg JM, Opmeer BC, Timmermans A. Does probability guided hysteroscopy reduce costs in women investigated for postmenopausal bleeding? *ScientificWorldJournal* 2015; **2015**: 605312 [PMID: 25785283 DOI: 10.1155/2015/605312]

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: bpgoffice@wjgnet.com
Help Desk: https://www.f6publishing.com/helpdesk
https://www.wjgnet.com