



Comparison of Transvaginal Ultrasonography and Hysteroscopy in the Diagnosis of Endometrial Polyp in Abnormal Vaginal Bleeding

Chia Hassan Ali* Rozhan Yassin Khalil**

Abstract

Background and objectives: Various methods and devices are currently applicable to diagnose endometrial polyps with different outcomes. This study aimed to compare the efficacy of transvaginal ultra-sonography in relation to the rigid hysteroscopy in the diagnosis of endometrial polyps in patients with abnormal vaginal bleeding.

Methods: This cross-sectional study enrolled 70 female patients with endometrial polyps at Sulaimani Maternity Teaching Hospital, Iraq, from May 01, 2022 to May 01, 2023. A well-designed questionnaire including the patient's age, gender, residency, educational level, parity, and presentation symptoms. Then, transvaginal ultrasonography and rigid hysteroscopy were done for all enrolled patients to determine the type of endometrial polyp.

Results: Most patients (57.14%) were aged 30-40 years, from suburban regions (47%), graduated from preparatory school (47.14%), multipara (91.43%) and had heavy vaginal bleeding (72.86%). Upon transvaginal ultrasonography and rigid hysteroscopy examinations, most females were diagnosed to have simple endometrial polyp (84.21% and 86.84%, respectively), followed by endometrial hyperplasia with atypia (60% and 100, respectively), then pedunculated leiomyoma (70% and 90%, respectively), and benign endometrial polyps (57.14% and 71.42%, respectively). There was no significant difference ($p=0.19$) between transvaginal ultrasonography and rigid hysteroscopy in sensitivity and specificity for diagnosing simple endometrial polyps.

Conclusions: Transvaginal ultrasonography and rigid hysteroscopy methods are preferred to diagnose endometrial polyps; in which rigid hysteroscopy is preferable for endometrial hyperplasia with atypia, and transvaginal ultrasonography is for benign endometrial polyps.

Keywords: Cross-sectional study, Endometrial polyp, Hysteroscopy, Ultrasonography, Vaginal bleeding

*MBChB, KHCMS/Obstetrics and Gynecology Trainee, Sulaimani Maternity Teaching Hospital, Sulaimani Directorate of Health, Sulaimaniyah, Iraq. E-mail: chyahassan2012@gmail.com (Corresponding author)

**MBChB, FICS, HDOG, FICOG, GABOG, Assistant Professor of Obstetrics and Gynecology at Department of Clinical Sciences, College of Medicine, University of Sulaimani, Sulaimaniyah, Iraq. E-mail: rozhan.khalil@univsul.edu.iq



Introduction

Endometrial polyps (EPs) are characterized by hypergrowth of endometrial glands that generally protrude into the uterine cavity. Endometrial polyps can affect reproductive and postmenopausal females. Endometrial polyps are moderately expected and may result in abnormal bleeding during the period. In asymptomatic patients, it may degenerate suddenly, while in symptomatic ones, it can be excised carefully and proficiently with various methods.¹ Regarding the etiology of EP development, it was postulated that cellular alterations on chromosomes 6, 7 and 12, together with genetic factors including enzymatic and metabolic modifications, may cause EP development. However, risk factors for the growth of EPs are directly related to age, diabetes, hypertension, obesity, late menopause, and tamoxifen usage.² Endometrial polyps are often detected pathological outcomes in the uterus and are typically non-malignant.³ The prevalence of EPs is unknown, and 82% of the women with histopathology-confirmed EPs were asymptomatic.⁴ Endometrial polyps have been associated in 50% of patients with abnormal bleeding and 35% of cases with infertility.^{1, 5} The commonly used diagnostic investigations to examine the source of bleeding are endometrial biopsy and transvaginal ultrasonography (TVU).⁶ Endometrial malignancy is the primary troublesome source of abnormal bleeding.⁷ Criteria for diagnosing uterine polyps vary based on the utilized test, but ideal testing still needs to be solidified.⁸ Transvaginal ultrasonography is the gold tool for estimating abnormal uterine bleeding in pre/postmenopausal women that can identify its anatomical reasons.⁶ Hysteroscopy (HS), predominantly when joined with endometrial biopsy, is supreme in its sensitivity/specificity in classifying benign/malignant diseases.⁹ Hysteroscopy is performed to evaluate and treat abnormal

bleeding, infertility, and abortion. It is a straightforward procedure with fewer morbidity ratios than other, more invasive procedures.¹ The better clinician training, developments in the equipment/distention media, and the expansion of small-diameter devices have led to the extensive use of this method.¹⁰ Most EPs are diagnosed at imaging by TVU or rigid HS, and approval is delivered by histopathological examination. Thus, in the clinical field, the features that explain an EP correlate to the diagnostic modality.⁸ Therefore, this study is designed to compare the results of using TVU and rigid hysteroscopy (RHS) to diagnose EPs in patients with abnormal vaginal bleeding in Sulaimaniyah, Iraq.

Patients and methods

This cross-sectional study was conducted from May 01, 2022, to May 01, 2023, on 70 female patients who attended the Gynecology and Obstetrics Department, Sulaimani Maternity Teaching Hospital, Sulaimaniyah, Iraq. Patients with abnormal vaginal bleeding, EPs, and thickened endometrium, regardless of age, nationality or ethnicity, were enrolled in this study. A validated questionnaire collected sociodemographic data, including age, residency, educational level, parity, and presentation symptoms. The Scientific Committee approved the study protocol at the Kurdistan Higher Council for Medical Specialties (KHCMS), Sulaimaniyah, Iraq. Participants' written consent was gained before starting the study. The EP was diagnosed and confirmed, and then all women underwent TVU and RHS in in operative theatre to collect biopsies. Later on, specimens were sent to histopathological examination and the results were collected. The Statistical Package for the Social Sciences (SPSS, IBM, USA, version 26), including Shapiro-Wilk and Kolmogorov–Smirnov tests, was used to find the normal distribution of the data. The Chi-square test was used for categorical variables. The





Spearman correlation test determines a correlation between the numerical variables. $P \leq 0.05$ was considered a significant difference.

Results

The mean age of the patients was 36.84 ± 5.58 years, ranging from 23-45 years. Most patients (57.14%, $n=40$) were aged 30-40 years, followed by > 40 years (30%, $n=21$), and then the least (12.86%, $n=9$) were < 30 years. Also, most patients (47%, $n=33$) were from suburban, followed by urban (40%, $n=28$), then rural (12.86%, $n=9$). Regarding the education level, preparatory school recorded the highest level (47.14%, $n=33$), then university/institute (21.43%, $n=15$), while primary school was the lowest (5.71, $n=4$). Most patients were multipara (91.43%, $n=64$), and only 8.57% ($n=6$) were nullipara. The mean duration of the symptoms among patients was 3.38 ± 3.39 months. The most abundant presenting symptom was heavy vaginal bleeding (72.86%, $n=51$), followed by irregular vaginal bleeding (17.14%, $n=12$), prolonged vaginal bleeding (7.14%, $n=5$), then intra-menstrual bleeding (2.86%, $n=2$), as shown in Table (1). Based on the TVS examination of the samples, 84.21% of patients ($n=32$) were diagnosed to have simple EH (no atypia), 60% had EH with atypia ($n=3$), 70% had pedunculated leiomyoma ($n=7$), and 57.14% had benign EP ($n=4$). While the results from RHS realized that 86.84% had simple EH (no atypia) ($n=33$), 100% had EH with atypia ($n=5$), 90% had pedunculated leiomyoma ($n=9$), and 71.42% had benign EP ($n=5$), as shown in Table (2).

Table (1): Characteristics of the studied patients.

Variable	Number	%
Age (Years)		
< 30	9.0	12.86
30-40	40	57.14
> 40	21	30.00
Residency		
Urban	28	40.00
Suburban	33	47.14
Rural	9.0	12.86
Education level		
Illiterate	6.0	8.57
Primary school	4.0	5.71
Secondary school	12	17.14
Preparatory school	33	47.14
University/Institute	15	21.43
Parity		
Nullipara	6.0	8.57
Multipara	64	91.43
Presenting symptom		
Heavy vaginal bleeding	51	72.86
Intra-menstrual bleeding	2.0	2.86
Irregular vaginal bleeding	12	17.14
Prolonged vaginal bleeding	5.0	7.14
Total	70	100

Table (2): Frequency and percentages of endometrial polyps using transvaginal ultrasonography (TVS) and rigid hysteroscopy (RHS).

Diagnosis	Number	TVU	RHS
		Number, %	
No abnormal pathology	10 (14.2)	4.0 (40.0)	8.0 (80)
Simple endometrial hyperplasia (no atypia)	38 (54.2)	32 (84.21)	33 (86.84)
Endometrial hyperplasia with atypia	5.0 (7.14)	3.0 (60)	5.0 (100)
Pedunculated leiomyoma	10 (14.2)	7.0 (70)	9.0 (90)
Benign endometrial polyp	7.0 (10)	4.0 (57.14)	5.0 (71.42)
Total	70 (100)	46 (65.71)	60 (85.71)





For diagnosing simple EH, there was no significant difference between TVU and RHS in sensitivity and specificity (p=0.19). Rigid hysteroscopy had better sensitivity for diagnosing EH with atypia (p<0.001). However, specificities did not differ

(p=1.00). Regarding pedunculated leiomyoma, RHS had better sensitivity and specificity (p<0.001) than TVU. Transvaginal ultrasonography had better sensitivity (p=0.041) but the same specificity as RHS (p=1.00), as shown in Table (3).

Table (3): Diagnostic value of methods used to diagnose endometrial polyp in patients with abnormal vaginal bleeding.

Diagnosis	Sensitivity	Specificity	PPV	NPV	LR (+)
Simple endometrial hyperplasia (no atypia)					
TVU	84.2(72.6-95.8)	66.7(13.3-100)	96.9(91.1-100)	25.0(0.0-55.1)	2.5(0.5-12.6)
HS	86.7(76.1-97.6)	66.7(13.3-100)	97.1(91.3-100)	28.6(0.0-62.0)	2.6(0.5-12.9)
Endometrial hyperplasia with atypia (susceptible to malignancy)					
TVU	60(17.1-100)	50(0.0-100)	75.0(32.5-100)	33.3(0.0-86.7)	1.2(0.2-6.5)
HS	100(100-100)	50(0.0-100)	83.3(53.5-100)	100(100-100)	2.0(0.5-8.0)
Pedunculated leiomyoma					
TVU	70(41.6-98.4)	33.3(0.0-86.7)	77.8(50.6-100)	25.0(0.0-67.4)	1.1(0.4-2.6)
HS	90(71.4-100)	66.7(13.3-100.0)	90(71.4-100.0)	66.7(13.3-100)	2.7(0.5-13.6)
Benign endometrial polyp					
TVU	57.1(20.5-93.8)	50(0-100)	80(44.9-100)	25(17.4-67.4)	1.1(0.3-5.3)
HS	71.4(37.9-100)	50(0-100)	83.3(53.5-100)	53.3(0-86.7)	1.4(0.3-6.2)

Numbers in parentheses denote 95% confidence intervals. TVU: Transvaginal ultrasonography, RHS: Rigid Hysteroscopy, PPV: positive predictive value, NPV: Negative predictive value; LR (+): Positive likelihood ratio

Discussion

Noninvasive examinations such as TVU, with/without using 3-dimensional (3D) ultrasonography and contrast systems, persist as the backbone of first-line investigation for diagnosing/managing EP. Hysteroscopy is the most potential modality for EPs and permits histologic assessment, whereas blind biopsy/curettage has little diagnostic precision.¹¹ This is the first research on this topic in our locality using TVU and RHS and comparing their outcomes. Hence, in the current study, the mean age of the patients was 36.84 ± 5.58 years, agreed with that of Malik et al. who found the mean age of women to be 33 ± 9.749, while a very recent study revealed that EPs can occur at all ages; with a peak incidence between 40-49 years old.^{12, 13} Conversely, Vitale et al. stated that the risk of developing EP increases from

menarche to the end of the reproductive age. Still, the de-novo incidence of EPs during menopause is unclear.¹⁴ Also, another study mentioned that the prevalence of EPs in reproductive women with abnormal bleeding was 20-40%.¹⁵ Another dreaded concept is that the risk of malignancy in EPs increases with age while decreasing in premenopausal women.² In this study, most patients were multipara (91.43%), similar to Malik and Zeb study who stated that 85% of patients were multipara, and the rest were primipara.¹² Additionally, another study found that EP (10%) results in abnormal bleeding in 50% of multipara women.¹⁶ Moreover, in this study, the most abundant presenting symptoms of patients with EPs were heavy vaginal bleeding (72.86%), then irregular vaginal bleeding, prolonged vaginal bleeding, and the least intra-menstrual bleeding (7.14%). In





this regard, Hassa et al. study explained that 36.1% of postmenopausal women and 44.4% of reproductive women were asymptomatic.¹⁷ Our results also agreed with Kanthi et al. study, which stated that the most common symptom of polyp involvement is abnormal uterine bleeding, especially in premenopausal women; however, some patients were completely asymptomatic.¹⁸ Also, Kanthi et al. showed that 45.6% of patients had abnormal vaginal bleeding, 4% had the typical intermenstrual bleeding, 47.7% of postmenopausal women were symptomatic with vaginal bleeding, 5.5% had infertility, while others had lower abdominal pain, backache, vaginal discharge, pruritus vulva and hirsutism.¹⁸ Furthermore, in this study, the patients' TVS and RHS examinations showed that most patients were diagnosed with simple EH (no atypia) (54.2%), followed by EH with atypia (7.14%) (susceptible to malignancy), then pedunculated leiomyoma (14.2%), and benign EP (10%). In this regard, Ghoubara et al. found 92% of women with benign polyps and 8% with EH (atypia).¹⁹ Generally, malignant transformation of EPs accounts for 0-13% related to age (>60) and menopausal condition. The prevalence of malignant EPs in symptomatic postmenopausal females is 4.47%, and it was 1.51% in non-symptomatic ones.¹³ Other risk factors for malignant EPs are polyp size, symptomatic bleeding, and polycystic ovarian syndrome.²⁰ Vaginal bleeding enhanced the malignant EPs than asymptomatic women.²¹ There is a higher incidence of concurrent EP, especially in women with Heidelberg Retinal Tomography (HRT).² Transvaginal ultrasonography is a widely available, relatively cheap and practical method to evaluate uterine pathologies and incredible initial diagnosis of EPs. It is noninvasive and causes minimal discomfort to the patient.²² Hysteroscopy is more accurate than other tools that permit direct sampling and elimination of EPs.¹

However, HS offers a more suitable assessment than TVU for uterine disorders and polyps.²² Thus, in the present study, both techniques were used to diagnose EPs in patients with abnormal vaginal bleeding, and the results showed that both TVU and RHS had the same sensitivity and specificity for diagnosing simple EH, while RHS had better sensitivity for diagnosing EH with atypia; however, specificities did not differ. Regarding pedunculated leiomyoma, RHS had better sensitivity and specificity than TVU. Meanwhile, TVU had better sensitivity but the same specificity as RHS for diagnosing benign EPs. In this regard, Vitale et al. suggested TVUS as the imaging modality of choice for detecting EPs in women of fertile age. Also, they recommended avoiding Dilation and Curettage (D&C) for diagnosing and managing polyps. Whereas RHS presented the highest diagnostic accuracy in infertile patients with suspected EPs and cases of atypical hyperplasia or carcinoma, hysterectomy is recommended in postmenopausal patients and premenopausal patients without a desire for future fertility.¹⁴ Furthermore, Nijkang et al. suggested that EPs may regress spontaneously in asymptomatic cases, while EPs can be treated safely and efficiently with HS excision in symptomatic cases.¹

Conclusions

Young adult females are more vulnerable to getting EPs. Simple EH is a predominant type of EP among diagnosed cases. Simple EH can be analyzed with either TVU or RHS. Endometrial polyp with atypia/pedunculated leiomyoma is better to be diagnosed with RHS; however, the benign EP is preferred to be diagnosed with TVU.

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Conflict of interest

It is not declared.

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