International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Choudhary J et al. Int J Reprod Contracept Obstet Gynecol. 2017 Aug;6(8):3607-3613
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20173494

Original Research Article

Evaluation of abnormal uterine bleeding with transvaginal sonography and hysteroscopy in perimenopausal women

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Received: 12 June 2017
Accepted: 08 July 2017

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ABSTRACT

Background: Abnormal uterine bleeding is defined as any deviation from the normal menstrual cycle this include change in regularity, frequency of menses, duration or amount of bleeding during or in between periods. Objective of present study was to evaluate abnormal uterine bleeding with transvaginal sonography and hysteroscopy in perimenopausal women.
Methods: This study is conducted on women presenting to the gynecological OPD with complain of abnormal uterine bleeding in perimenopausal age group. A total of 50 patients were subjected to transvaginal sonography and Diagnostic hysteroscopy.
Results: On TVS, out of total 50 patients, 50% patient showed normal endometrial finding. 24% Patient showed Endometrial hyperplasia, 14% Endometrial Polyp, 8% Submucosal fibroid, 4% Adenomyosis. On TVS, out of total 50 patient, 50% patient showed normal endometrial finding. 24% Patient showed endometrial hyperplasia, 14% endometrial Polyp, 8% submucosal fibroid, 4% adenomyosis. Out of total 50 patients, 28 (56%) showed normal endometrial finding.20% cases showed endometrial Hyperplasia, 16% showed endometrial Polyp, 8% showed submucosal fibroid. Sensitivity, specificity, PPV, NPV of endometrial hyperplasia – 81.81%, 92.3%, 75%, 94.73% respectively.
Conclusions: Transvaginal sonography has a moderate diagnostic accuracy in detecting endometrial hyperplasia and other intrauterine pathology. TVS is safe, acceptable and easily available & is noninvasive. It should be used as 1st line diagnostic tool in patients with AUB in perimenopausal women. Hysteroscopy has important tool in the diagnosis of various endometrial and intrauterine lesions TVS and hysteroscopy should be employed hand in hand in evaluation of AUB.

Keywords: AUB, Hysteroscopy, TVS

INTRODUCTION

Abnormal uterine bleeding is defined as any deviation from the normal menstrual cycle this include change in regularity, frequency of menses, duration or amount of bleeding during or in between periods.[1] AUB is responsible for 20-30% of patient who attend gynaec outpatient department amongst women in reproductive age group and 50% in a perimenopausal women and significantly impacting quality of life and imposing financial burden.[2,3] The International Federation of Gynecology and Obstetrics working group on menstrual disorders has proposed a classification system (PALM-COEIN) for causes of the AUB in women.[4] There are nine main categories, which are arranged according to the acronym PALM-COEIN: Polyp; adenomyosis; leiomyoma; malignancy and hyperplasia; coagulopathy;

ovulatory dysfunction; endometrial; iatrogenic; and not yet classified.

According to the proposed classification system, non-specific term like dysfunctional uterine bleeding should be abandoned and more than one etiology can be responsible in same patient. Among all, fibroid and polyp are one of the most common causes which are responsible for anatomical causes of AUB and approximately 20-40% women are affected.[5]

AUB in perimenopausal women demonstrated prevalence of endometrial hyperplasia (11.8%), polyp (4.2%) and adenocarcinoma as (5.5%) respectively.[6] Endometrial hyperplasia is a known precursor for endometrial carcinoma and it can progress to more severe pathology which is time related. Less than 2% of hyperplasia without atypia progress to endometrial carcinoma in 23% over a mean duration of 4 years.[7,8]

The incidence of hyperplasia and cancer are more common in perimenopausal women with AUB. 14 % women with recurrent anovulatory cycles develop hyperplasia or cancer.[9] Malignancy is important in peri- and postmenopausal women but also in women over age 35 with a history of chronic anovulation or obesity and in women ages 18 to 35 who have risk factors for endometrial cancer.

TVS is an inexpensive, non-invasive and a convenient way to assess the uterine pathology Therefore, it is recommended as a 1st line diagnostic tool for assessing uterine pathology in perimenopausal age women presenting with AUB. Transvaginal ultrasound can be valuable aid in evaluating the woman presenting with complaints of abnormal vaginal bleeding by demonstrating anatomical abnormality not discernible on pelvic examination such as small cyst and leiomyoma and in evaluating the endometrium in term of thickness and ovulatory and hormonal status of the endometrium.

In perimenopausal women TVS shows ET of less than 5 mm, the probability of the woman having endometrial cancer is 1.7 % and it is 0.8 % when the cut-off is taken as 4 mm. Transvaginal ultrasound detects intracavitary abnormalities like uterine tumors, polyps, and endometrial and myometrial abnormalities with a sensitivity of 60–92% and a specificity of 62–93 % in perimenopausal women.[10]

TVS is not 100% sensitive for diagnosing endometrial polyps and other small lesions, examination with other imaging techniques like saline infusion sonohysterography (SIS) or hysteroscopy should be considered. Another limitation of ultrasound is that it cannot always reliably distinguish between benign proliferation, hyperplasia, polyps, and cancer, and in 5–10% of women with postmenopausal bleeding, the endometrium cannot be identified on TVS, these women need further evaluation with more sensitive techniques.

Hysteroscopy directly evaluate the uterine cavity which is reliable method for investigating women with abnormal uterine bleeding and is easy to perform and widely available in our setup. Hysteroscopy can accurately detect endometrial hyperplasia, endometrial polyp, submucosal myoma and endometrial atrophy. Hysteroscopy is recommended to further evaluate the endometrium in perimenopausal women with abnormal bleeding when the endometrial echo is normal on transvaginal sonography.

Hysteroscopy guided biopsy is considered the gold standard for assessing the endometrium, hysteroscopy is more sensitive than TVS and d and c which is performed blindly. With adavancement in hysteroscope technique and equipment, hysteroscopy has now become very easy to perform on OPD basis with minimal anesthesia. In this study after detail clinical and physical examination TVS and hysteroscopy was done in women of perimenopausal age group with AUB and compare the sensitivity, specificity and efficacy of TVS and hysteroscopy in diagnosis and to correlate the TVS and hysteroscopy finding with histopathology.

Objectives of present study were to estimate the diagnostic accuracy of two dimensional transvaginal ultrasound and hysteroscopy in evaluation of uterine cavity lesion in perimenopausal women with abnormal uterine bleeding and to compare the sensitivity and specificity of transvaginal and hysteroscopy and correlate the efficacy of both in diagnosing intrauterine pathology in abnormal uterine bleeding.

METHODS

This Prospective study is conducted in department of Obstetrics and Gynecology in Mahatma Gandhi Hospital, Jaipur from feburary 2015 to October 2016. This study was done on women presenting to the gynecological OPD with complain of abnormal uterine bleeding in perimenopausal age group were invited to participate in the study. The inclusion and exclusion criteria were applied and the women who were eligible to participate and who give written consent were enrolled in the study. A total of 50 women who met the inclusion criteria were selected and after explaining the procedure, the consent form explained in their own language was signed.

Inclusion criteria

Patient having following characteristic were included

- Perimenopausal age group (40-55)
- Having abnormal uterine bleeding
- Uterus less than 12 weeks size.

Exclusion criteria

- Acute pelvic infection
- Uterus more than 12-week size

- Pregnant women
- Vaginal or cervical cause of bleeding
- Bleeding disorder
- Any drug intake

After selecting the patients who fulfill the eligibility criteria in the OPD detailed clinical history, obstetrical and gynecological history taken and detail clinical examination was done as per Proforma. The obstetrical history include parity, mode of delivery was taken. A detail menstrual history regarding the cycle length, no of days of menstruation and the type of abnormal bleeding was taken. Per speculum examination was done to note abnormal discharge, erosion, cervical hypertrophy or cervical polyp. A per vaginal examination was done to know about any uterine cervical and adenexal abnormality. Laboratory investigations including CBC, coagulation profile, random blood sugar, liver and kidney function and pregnancy test done. All the eligible patients were subjected to transvaginal sonography. TVS was done by using 5 MHz transvaginal probe and various sonographic parameters such as endometrial thickness, uterine pathology, adnexal and any other pelvic pathology is noted.

Diagnostic hysteroscopy is carried out to all patient of perimenopausal age group with abnormal uterine bleeding under general anesthesia. In proliferative phase endometrium is smooth and pink-white in colour, gland opening s appear as white ringed elevation surrounded with netlike vessel. In secretory phase of cycle endometrium is lush and velvety, can be mistaken for small polyp.

For hysteroscopy

- Hyperplasia- Thick hyper-vascular friable mucosa, mammilated or polypoid in appearance, further classified as simple or atypical by the pathologists
- Polyp - Soft intracavitary formation, which was easily mobilized and covered by mucosa with endometrial gland and no distended vascular network.
- Fibroid - Firm intracavitary formation with thin endometrial lining and superficial large blood vessels.
- Endometritis - Irregular proliferation of glands and the presence of chronic inflammatory cells e.g. plasma cells, macrophages, and lymphocyte in the endometrial stroma.

After Hysteroscopic evaluation biopsy for histopathological evaluation was done and it was taken as a Gold standard. After tabulating the findings of TVS and Hysteroscopy it was compared with histopathology and the sensitivity, specificity, PPV and NPV of TVS and Hysteroscopy were calculated and compared.

RESULTS

Out of 50 patients in this study ranged from 40-55 yr. mean age was year. Majority of patient were in age group of 40-44 years (48%) and minimum 14% in age group of 50-55 yr. In study population, 47 patients (94%) were multiparous and primiparous and nulliparous were 2% and 4% respectively, Maximum no of cases belonged to class III (56%). Rest of patient according to socioeconomic class were in class I (6%), Class II (4%), class IV (16%) and class V (18%) respectively.

Table 1: Distribution of cases according to the clinical presentation.

Bleeding pattern	No. of patients	%
Heavy menstrual bleeding (menorrhagia)	25	50
Inter menstrual bleeding (metro)	9	18
Frequent bleeding (poly)	8	16
Heavy prolonged bleeding (menometro)	2	4
Irregular menstrual bleeding	6	12
Total	50	100

Table 1 showed distribution of cases according to clinical presentation, out of 50 cases maximum no of patient (50%) presented with heavy menstrual bleeding, this is revised terminology by AICOG which correspond to menorrhagia, while frequent bleeding in (16%) of patient, intermenstrual bleeding in (18%) and heavy prolonged bleeding in (4%) and irregular bleeding in (12%) of patient.

Table 2: Relation of type of bleeding and TVS findings.

Endometrial thickness (mm)	Menstrual symptoms				
	HMB	**IMB**	**Frequent**	**HPB**	**Irregular**
<5	1	1	0	0	0
6-9	14	2	3	2	2
10-14	6	4	3	0	2
15-19	2	1	1	0	1
>20	2	1	1	0	1
Total	**25**	**9**	**8**	**2**	**6**

Table 2 show correlation of patient's menstrual symptom with endometrial thickness. Out of 25 cases of Heavy menstrual bleeding maximum no of patient 14 had ET between 6-9 mm, 6 patient had ET between 10-14mm, 2 patient had heavy menstrual bleeding with ET >20 mm, on histopathology one of patient had atypical hyperplasia and one patient also had atypical hyperplasia on ET between 15-19. 9 patients of intermenstrual bleeding, 4 patient had ET between 10-14. 8 patients of frequent bleeding, 3 patient had ET between 6-9mm, 3 patients had ET 10-14mm, 1 had ET between 15-19 mm, and 1 had ET >20 mm. 6 patient of irregular bleeding 2 had ET 6-9 mm, 2 had ET between 10-14 mm and 1 patient had ET between 15-19 and 1 had ET >20 mm.

Table 3: Endometrial thickness on TVS in relation to histopathology.

Endometrial thickness	Total	Histopathological findings				
		Normal	EH	EP	SMF	A
<5	2	2				
6-9	23	16	2	1	2	2
10-14	15	6	5	1	2	1
15-19	5		2	3		
>20	5		2	3		
Total	50	24	11	8	4	3

Table 3 shows different endometrial thickness on TVS in relation to histopathological findings. Out of total 50 cases, 2 patient had ET<5mm which were normal on histopathology. 23 patient showed endometrial thickness 6-9 mm on TVS, of which 16 cases were normal on histopathology, 2 case had endometrial hyperplasia, 1 case had polyp, 2 cases had submucosal fibroid and 2 cases had adenomyosis. 15 cases showed ET 10-14 mm, of which 6 cases were normal, 5 cases of endometrial hyperplasia, 1 case of endometrial polyp, 1 case of adenomyosis and 2 cases of submucosal fibroid were confirmed on histopathology. 5 cases showed ET 15-19mm. Out of which 3 cases were of endometrial polyp and 2 cases of endometrial hyperplasia. 5 cases showed ET >20 mm on TVS out of which 2 cases had endometrial hyperplasia and 3 were of endometrial polyp.

Table 4: Diagnosis of endometrial pathology in AUB patient with TVS.

Endometrial findings on TVS	No. of cases	%
Normal	25	50
Endometrial hyperplasia	12	24
Endometrial polyp	7	14
Submucosal fibroid	4	8
Adenomyosis	2	4
Total	50	100

Table 4 shows endometrial finding on TVS in AUB patients. It showed that out of 50 cases of AUB, majority of patients were normal (50%) and 50% had abnormal endometrial finding. Most common abnormal finding was endometrial hyperplasia (24%) followed by polyp 14%, sub mucosal fibroid and adenomyosis 8% and 4% respectively.

Table 5: Finding of hysteroscopy compared with HPR.

Hysteroscopy Findings	Total	Hystopathological finding				
		N	EH	EP	SMF	A
Normal	28	22	3			3
Endometrial Hyperplasia	10	2	8			
Endometrial Polyp	8			8		
Submucosal Fibroid	4				4	
Grand Total	50	24	11	8	4	3

Table 5 shows that hysteroscopy showed 28 cases (56%) as normal finding, of which 22 cases had normal endometrial finding, 3 cases showed endometrial hyperplasia and 3 cases had adenomyosis on histopathology.

Table 6: Diagnosis of endometrial pathology in AUB patients by TVS, Hysteroscopy and HPR.

Final Diagnosis	Diagnosed by TVS	Diagnosed by Hysteroscopy	Diagnose by HPR	%
Normal endometrium	25	28	24	48
Endometrial hyperplasia	12	10	11	22
Endometrial polyp	7	8	8	16
Submucosal fibroid	4	4	4	8
Adenomyosis	2	0	3	6

Out of 11 cases of endometrial hyperplasia 8 cases were correctly diagnosed by hysteroscopy and 3 cases were missed and showed normal endometrium, and 2 case misdiagnosed which were normal on histopathology. 8 cases of polyp were diagnosed by hyseteroscopy of which all had polypoidal endometrium on histopathology. 4 cases of submucosal fibroid diagnosed by hysteroscopy of which all had submucosal fibroid on histopathology.

Table 6 show Diagnosis of Endometrial Pathology in AUB Patients by TVS, Hysteroscopy and HPR. Out of 50

cases of AUB patient, majority of patients had normal endometrial finding in 48% on histopathology followed by endometrial hyperplasia (22%), endometrial polyp 16% and submucosal fibroid and adenomyosis less comparatively 8%, 6% respectively.

DISCUSSION

Abnormal uterine bleeding is most common gynecological complaint among women in perimenopausal age group**.**

Distribution according to bleeding pattern

In present study, analysis of patients according to bleeding pattern the most common bleeding pattern was heavy menstrual bleeding (50%) which was comparable to the study by Pillai SS et al[11]. They had 46.5% patients with menstrual complaints of menorrhagia.

Arnold J et al[12] also had Heavy menstrual bleeding (HMB) in maximum no. of cases (43.7%). Shobhita GL et al showed menorrhagia in (40%) of cases.[13]

Other bleeding pattern in present study was frequent bleeding (14%), intermenstrual bleeding (18%), heavy prolonged (6%) and irregular bleeding (12%). This was comparable to Urvashi et al.[14] In their study, they had polymenorrhoea in (23%) of cases and metrorrhagia in (19%) of cases. Shobhita GL et al also had polymenorrhagia in 25% of patients (7%).[13]

In this study one patient who had ET >20 mm and had heavy menstrual bleeding, showed atypical endometrial hyperplasia on histopathology. Similarly, one patient with ET 15-19 mm had atypical endometrial hyperplasia.

Endometrial thickness on TVS

In my study on TVS at endometrial thickness 5 to 8 mm, no endometrial pathology was found which was comparable with other studies Shobhitha GL et al also observed that no endometrium abnormality was found on ET <8mm.[13] Veena BT et al revealed normal endometrium in 45% (majority of these patients had endometrial thickness less than 9mm).[15]

In most of studies it revealed that endometrial thickness of 8 mm could be taken as cut off in perimenopausal women and in present study the similar finding was observed.

Abnormal endometrial finding on TVS

In this study analysis of patient's findings on TVS were compared with endometrial finding and TVS finding was compared with histopathological findings. In present study, Endometrial hyperplasia by on TVS was found in 12 cases, on comparison with histopathology report 9 cases were truly diagnosed on TVS and 2 cases missed and 3 cases misdiagnosed out of which one was normal, one was endometrial polyp and one was adenomyosis on histopathology report.

Endometrial polyp was found on TVS in 7 cases, on comparison with histopathology, 5 cases identified as truly on TVS and 3 cases missed by TVS and 2 cases misdiagnosed out of which 1 case had normal endometrium and 1 case had endometrial hyperplasia on histopathology.

Sub mucosal fibroid was found on TVS in 4 cases. On comparison with histopathology 3 cases had sub mucosal fibroid and 1 case had normal endometrium on histopathology, and one case misdiagnosed as submucosal fibroid which was normal on histopathology.

On histopathology report 3 cases of adenomyosis were found, on TVS one case correctly diagnosed as adenomyosis and 2 cases missed out of which 1 was normal and 1 was endometrial hyperplasia on TVS and one case misdiagnosed as adenomyosis which was normal on histopathology.

Takreem et al reported 15% of cases of endometrial hyperplasia among 100 perimenopausal women.[16] Slobada L et al showed endometrial hyperplasia in 22.6% cases, in the study by Dangal G et al, the incidence was 23%.[17,18] which is in concordance with TVS findings in present study 24%.

In present study the sensitivity, specificity, PPV, NPV for diagnosis of endometrial hyperplasia on TVS was 81.81, 94.43%, 90%, 95% which correlated with findings of Shokouhi B.[19] The accuracy, sensitivity, specificity, PPV, and NPV were 88.25%, 90.7%, 84%, 97.7%, and 84% in premenopausal women in AUB patients specially in endometrial hyperplasia in their study. Aslam et al reported sensitivity and specificity of TVS 81.3%, 73.6% respectively.[20]

Endometrial finding on hysteroscopy

In present study, analysis of patients on hysteroscopic finding showed normal endometrium in 56% of patients and remaining 44% showed endometrial pathology.

In current study, hysteroscopy showed endometrial hyperplasia in 20% cases of AUB and other intrauterine pathology observed was polyp which was found in 16% of cases, sub mucosal fibroid in 8% of cases respectively.

Out of 8 cases of endometrial polyp all 8 were diagnosed on hysteroscopy and all 4 cases of sub mucosal fibroid was also diagnosed by it. It showed that hysteroscopy had very high sensitivity and specificity to diagnose intra uterine pathology such as polyp and sub mucosal fibroid as compared to TVS. These finding correlated with Sheetal et al, they showed hyperplasia in 18%, endometrial polyp 9%, and sub mucosal myoma 11%.[21]

In present study, the incidence of other pathological lesion such as polyp and sub mucosal fibroid correlated with the study by Veena BT et al it was seen that sub mucus fibroid found in 6.7% and polyps in 15% of cases by hysteroscopy.[15] Similarly, Astudillo et al and Sciarra JJ et al also had similar pick up rates of the intra-cavitary lesions.[22,23] In present study the sensitivity, specificity, PPV and NPV for endometrial hyperplasia on hysteroscopy was 72.72%, 94.87%, 88.88%, 92.5% respectively. Loverro et alstated the sensitivity, specificity, positive predictive value and negative predictive value was 98%, 95%, 63% and 99%, respectively, for endometrial hyperplasia.[24]

In present study the sensitivity, specificity, PPV, NPV was 100% for polyp and sub mucosal fibroid in hysteroscopy. It correlates with the findings of Sheetal et al[64] in which sensitivity, specificity, positive predictive value and negative predictive value of hysteroscopy for endometrial polyp was 100%.

Panda et al, Acharya V et al showed the sensitivity and specificity of hysteroscopy for sub mucous fibroid was 100%.[25,26] Sheetal et al showed the sensitivity, specificity, positive predictive value and negative predictive value of hysteroscopy for fibroid was 100% each.[21]

Table 7: Overall efficacy of hysteroscopy with transvaginal sonography with other studies.

Study	Procedure	Sensitivity	Specificity	PPV	NPV
Urvashi et al	TVS	73.07	95.83	95	76.66
	Hysteroscopy	89.79	97.56	97.95	90.56
Ritu Mishra et al	TVS	73.9	73.7	73.70	73.8
	Hysteroscopy	78.3	84.7	85.4	81
Present study	TVS	76	94	76	94
	Hysteroscopy	89.36	94.77	84.00	96.66

In the present study overall sensitivity, specificity, PPV, NPV of TVS were 76%, 94%, 76% and 94% respectively as compare to hysteroscopy which had overall sensitivity, specificity, PPV, NPV 89.36%, 94.77%, 84% and 96.66%. The sensitivity, specificity, PPV, NPV of present study fairly comparable with the study of Urvashi et al and Ritu et al.[14,27]

CONCLUSION

In conclusion, abnormal uterine bleeding which often prevails as an important and common gynecological ailment in my study 48% patient had normal endometrium, and 52% had abnormal uterine endometriual finding, out of which endometrial hyperplasia found in 22%, polyp in 16%, submucosal fibroid in 8%, and adenomyosis in 6% of cases. Both TVS and hysteroscopy can detect endometrial intracavitary abnormalities with varying accuracies.

The sensitivity, specificity, PPV, NPV of TVS was 76%, 94%, 76% and 94% and sensitivity, specificity, PPV, NPV of hysteroscopy was 89.36%, 94.77%, 84% and 96.66%.

The result showed that Transvaginal sonography has a moderate diagnostic accuracy in detecting endometrial hyperplasia and other intrauterine pathology. TVS is safe, acceptable and easily available in most secondary and tertiary care setting and is noninvasive. It should be continued as 1st line diagnostic tool in patients with AUB in perimenopausal women.

The result showed that hysteroscopy has important tool in the diagnosis of various endometrial and intrauterine lesion, with high sensitivity, predictive value of a negative test and low false negativity

TVS and hysteroscopy should be employed hand in hand in evaluation of AUB after assessing the need and affordability of patient.

ACKNOWLEDGMENTS

Authors would like to acknowledge the Department of Anaesthesia and faculty of Department of Obstetrics and Gynecology, Mahatma Gandhi Hospital, Jaipur for their support during the study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Choudhary J, Acharya V, Jain M. Evaluation of abnormal uterine bleeding with transvaginal sonography and hysteroscopy in perimenopausal women. Int J Reprod Contracept Obstet Gynecol 2017;6:3607-13.