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Transvaginal ultrasonography as diagnostic modality in evaluation of abnormal uterine bleeding

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Abstract
Background: Abnormal uterine bleeding (AUB) is defined as any type of bleeding in which the duration, frequency or amount is excessive for an individual patient. It is a common reason for women of all ages to consult their gynaecologist and is the direct cause of a significant health care burden for women, their families and society as a whole. It affects 10-30% of reproductive age women and upto 50% of perimenopausal women. It is responsible for more than one-third of gynecologic consultations and nearly two-thirds of hysterectomies.
Aim and Objectives: The purpose of this study is to evaluate the diagnostic accuracy of TVS in the evaluation of abnormal uterine bleeding.
Material and Methods: This Prospective Observational study was conducted in the Department of Obstetrics and Gynaecology, Durgabai Deshmukh Hospital and Research Centre, Vidyanagar, Hyderabad over the period of one year between July 2018 to June 2019. Patients with clinical diagnosis of AUB satisfying the inclusion criteria were selected at random from the Gynaecology Out Patient Department of the hospital.
Result: Most common uterine pathology detected by USG was thickened endometrium consisting of 58.75% cases and most common histopathological finding was of endometrial polyp which was observed in 38.75% cases. In the diagnosis of any endometrial pathology, transvaginal ultrasonography had a sensitivity of 96.49%, specificity of 43.48%, PPV of 80.88%, NPV of 83.33% and accuracy of 81.25%.
Conclusion: It can be concluded that TVS can detect endometrial abnormalities with varying accuracies and can supplement in enhancing the accuracy of tissue diagnosis.

Keywords: Abnormal uterine bleeding (AUB), transvaginal sonography (TVS), positive predictive value (PPV), negative predictive value (NPV)

Introduction

Abnormal uterine bleeding (AUB) is defined as any type of bleeding in which the duration, frequency, or amount is excessive for an individual patient. It is a common reason for women of all ages to consult their gynecologist and is the direct cause of a significant health care burden for women, their families and society as a whole. It affects 10-30% of reproductive age women and upto 50% of perimenopausal women. It is responsible for more than one-third of gynaecologic consultations and nearly two-thirds of hysterectomies [1].

Though abnormal uterine bleeding is a common gynaecological presentation, it is often complex and difficult to diagnose. Thorough history and physical examination are fundamental for the workup of AUB [2]. Given that benign uterine diseases and endometrial hyperplasia are responsible for at least 70% of AUB cases, investigating the uterine cavity enables the gynaecologist to offer the most appropriate therapy. Fibroids or polyps are the most common cause of anatomic AUB. Diagnostic procedures for anatomic changes and for endometrial carcinoma include ultrasonography, hysteroscopy and dilatation & curettage (D&C) [3]. Endometrial abnormalities are common diagnostic challenges for the radiologist and referring gynaecologist. Diagnostic procedures for anatomic changes and for endometrial carcinoma include ultrasonography, hysteroscopy and dilatation & curettage (D&C) [3]. For the evaluation of AUB, transvaginal sonography plays an important role as the initial modality [4]. Transvaginal ultrasonography is useful in determining endometrial thickness and morphology as well as the regularity of the endo/myometrial border [5]. Transvaginal sonography (TVS) is considered a simple examination with good accuracy for most uterine cavity abnormalities. The uterus and its pathologic lesions can be visualized clearly but there are conflicting reports about its diagnostic accuracy.

A major limitation of TVS is the higher false negative rate in diagnosing focal intrauterine pathology. This is due to the physical inability of TVS to clearly assess the endometrium when there is concurrent uterine pathology such as leiomyomas or polyps [6]. Advance ultrasound equipment and multi frequency transducers are necessary to increase the sensitivity of the examination. One sixth of endometrial lesions are missed or are not diagnosed when TVS is used alone in the perimenopausal patient.

Dilatation & curettage is a blind procedure and the endometrium has to be sent to the pathologist to study. It also require skill so as to obtain an adequate sample of the endometrial tissue. Hysteroscopy is a surgical procedure in which a gynaecologist uses a small lighted telescopic instrument called a hysteroscope to diagnose and treat many uterine disorders, including abnormal bleeding. In the presence of organic lesions, hysteroscopy allows for the direct visualization of the probable uterine source of bleeding, improving the chance that the tissue obtained by directed biopsy will yield an accurate histological diagnosis. The currently available modalities are far from being perfect. The purpose of this study is to evaluate the diagnostic accuracy of TVS.

Material and Methods

A prospective comparative observational study of transvaginal ultrasonography and hysteroscopy as diagnostic modalities in evaluation of abnormal uterine bleeding was conducted in the Department of Obstetrics and Gynaecology, Durgabai Deshmukh, Hospital and Research Centre, Vidyanagar, Hyderabad during the time period of July 2018 to June 2019. Patients with clinical diagnosis of AUB satisfying the inclusion criteria were selected at random from the Gynaecology Out Patient Department of the hospital. Sample size was calculated by Open Source Epidemiologic Statistics for Public Health, dated 23rd June 2014. Standard population size was taken as 1 million. Anticipated % frequency of occurrence was taken as 5%. Confidence limits were taken as 5%. Design effect taken as 1. With this recommended sample size came to be 73 with 95% confidence level. By taking non responsiveness into account, total sample size was taken as 80.

Patients satisfying the inclusion criteria were enrolled after getting informed consent using random sampling method. It was a prospective study to evaluate the intrauterine pathology in 80 women with abnormal uterine bleeding.

For all patients, name, address, other personal and clinical details were recorded. Complete history including detailed menstrual history was taken as regards onset, course, duration, amount of bleeding; medical history (diabetes, hypertension, thyroid disorders) and surgical history were recorded. Detailed general, systemic and local examination to record the size of the uterus, its mobility and the presence of any cervical or adnexal masses was done. Along with this, patient was investigated to rule out organic causes of AUB with CBC, RFT, LFT, blood grouping and typing, coagulation profile, thyroid function tests and UPT to rule out pregnancy. All the data was duly recorded in the standard prepared proforma. After getting informed written consent for the procedure, transvaginal ultrasonography and endometrial biopsy was performed.

Results

A total of 80 patients of reproductive age group, premenopausal and postmenopausal women up to 60 years age presenting with AUB were selected for the study. All the patients with AUB were subjected to TVS and histopathological confirmation obtained for all. Hysteroscopy was done under intravenous sedation. It was successful in 100% of cases and concluded satisfactorily in almost all cases. There was no failure in any of the patients taken for study. During and after the procedure there was no complication.

Age group of the patients ranged from 25-60 years. Mean age was 47.06±9.00. The most common age group was 41-50 years. This group comprised of 41.25% of the patients. Next common age group was of patients aged greater than 50 years which comprised 35% of the patients. (Table 1)

Table 1: Age distribution

Age group	Total	Percentage
21-30 years	3	3.75
31-40 years	16	20
41-50 years	33	41.25
>50 years	28	35
Total	80	100

A total of 81.25% of patients were multiparous, 16.25% were primiparous and the rest 2.5% were nulliparous. (Table 2).

Table 2: Parity wise distribution

Parity	No. of cases	Percentage
Nullipara	2	2.5
Primipara	13	16.25
Multipara	65	81.25
Total	80	100

Menorrhagia was the commonest presenting symptom in this study. 43.75% patients presented with this symptom. The next common presentation was postmenopausal bleeding (37.5%) and metrorrhagia (12.5%). 2.5% patients came with polymenorrhagia and 3.75% with menometrorrhagia. (Table 3)

Table 3: Distribution of patients according to AUB

Menstrual cycle pattern	No. of cases	Percentage
Menorrhagia	35	43.75
Postmenopausal bleeding	30	37.5
Metrorrhagia	10	12.5
Menometrorrhagia	3	3.75
Polymenorrhagia	2	2.5
Total	80	100

Most of the patients (62.5%) presented within three months of the onset of symptoms.15% patients presented within 4-6 months. (Table 4)

Table 4: Duration of complaints

Duration(months)	No. of cases	Percentage
1-3	50	62.5
4-6	12	15
7-12	8	10
>12	10	12.5
Total	80	100

The commonest lesion diagnosed by TVS is endometrial hyperplasia which was found in 58.75% cases followed by endometrial polyp in 20% cases and normal endometrium in 15% cases. Other findings were submucous fibroid in 5% cases and cervical polyp in 1.25% cases. (Table 5)

Table 5: Findings of TVS and hysteroscopy

Finding	TVS	Hysteroscopy	HPE
Normal endometrium	12 (15%)	20(25%)	23 (28.75%)
Endometrial Polyp	16 (20%)	33(41.25%)	31 (38.75%)
Endometrial Hyperplasia	47 (58.75%)	16 (20%)	14(17.5%)
Submucosal Fibroid	4 (5%)	6 (7.5%)	6(7.5%)
Atrophic endometrium	0	1 (1.25%)	0
Carcinoma endometrium	0	0	1 (1.25%)
Cervical canal polyp	1 (1.25%)	4 (5%)	5(6.25%)
Total	80 (100%)	80 (100%)	80 (100%)

Histopathology reports of the tissue sent for biopsy came out to be normal (proliferative or secretory) in 28.75% patients. Endometrial polyp was reported in 38.75%. The rest consisted of hyperplasia in 17.5%, myoma in 7.5%, endometrial carcinoma in 1.25% and cervical polyp in 6.25% samples. (Table 6)

Table 6: Agreement between transvaginal ultrasonography and histological diagnosis

TVS	Normal endometrium	Endometrial polyp	Endometrial hyperplasia	Submucosal fibroid	Cervical polyp	Carcinoma endometrium	Total
Normal endometrium	10	-	-	1	1	--	12
Endometrial hyperplasia	12	19	14	1	1	-	47
Endometrial polyp	0	11	-	2	2	1	16
Submucous fibroid	1	1	-	2	-	-	4
Cervical polyp	-	-	-	-	1	-	1
Total	23	31	14	6	5	1	80

Discussion

Menstrual dysfunction is the cause of discomfort, inconvenience and disruption of healthy lifestyle, which affects millions of women in both the developed and the developing world. Abnormal uterine bleeding is one of the most frequently encountered conditions in gynaecology. As quoted by Prentice A.[7], AUB affects 10 to 30% of reproductive aged women and up to 50% of perimenopausal women.

This study evaluated the diagnostic performance of TVS. The sensitivity, specificity, positive predictive value and negative predictive value of the method was measured. The results were compared with results obtained from biopsy, the current gold standard for the investigation of endometrial lesions.

In the diagnosis of any endometrial pathology transvaginal ultrasonography had a sensitivity of 96.49%, specificity of 43.48%, PPV of 80.88%, NPV of 83.33% and accuracy of 81.25%. These results are similar to those of other published studies. Grimbizis *et al.* [8] found that TVS had sensitivities of 89.04 and specificities of 56%, for the detection of any endometrial pathology. Waleed El-khayat *et al.* [9] observed an overall sensitivity of 92.3%, specificity of 72.72%, PPV of 92.3%, NPV of 72.72% and accuracy of 88% for transvaginal ultrasonograph.

Transvaginal ultrasonography revealed sensitivity, specificity, PPV and NPV of 35.48%, 89.8%, 68.75% and 68.75% for endometrial polyp and 33.33%, 93.42%, 50% and 94.67% for submucous myoma. In addition, the accuracy of the method in the diagnosis of endometrial polyp and submucous myoma was shown to be 68.75% and 91.25% respectively. The diagnostic accuracy of TVS was 58.75% for endometrial hyperplasia, with sensitivity of 100%, specificity of 50%, PPV of 29.79% and NPV of 100%Ultrasound examination is a non invasive diagnostic method, well tolerated, relatively low-cost and universally considered the first choice in the initial evaluation of uterine structural pathologies [10]. However, the ability of transvaginal ultrasonography to distinguish among the many causes of thickened endometrium has been questioned [11, 12] and various endometrial pathologies with a significant number of false positive and false negative diagnoses have been observed, particularly polyps and endometrial hyperplasia [13].

In this study, only 14 of the 47 patients whose transvaginal ultrasonography revealed endometrial thickening effectively presented endometrial hyperplasia after hysteroscopy and biopsy. The single case of endometrial carcinoma was diagnosed as endometrial polyp on transvaginal ultrasonography.

In this study, TVS was not able to discriminate endometrial hyperplasia or endometrial cancer from intracavitary lesions; therefore, an increased number of endometrial polyps and myomas were not adequately recognized with this method. The findings of the ultrasound examination, therefore, led to a considerable number of false positive diagnoses concerning endometrial hyperplasia (PPV 29.79%).The specificity of TVS for the diagnosis of diseases of endometrium was consequently lower compared with the specificity of hysteroscopy. This finding correlates with study by Miriam da Silva Wanderley *et al.* [14] in which only 17 of the 48 patients whose transvaginal ultrasonography revealed endometrial thickening, who 83 subsequently underwent hysteroscopy and biopsy, effectively presented endometrial hyperplasia. Polyps, small myomas and normal endometrium were masked by a thick endometrium. Their study revealed a PPV of 15.6% for endometrial hyperplasia.

Conclusion

TVS is quick, non invasive, easy to perform, at low cost. Detection of abnormalities in the parametrium and ovaries is possible with TVS. It has significantly lower sensitivity but comparable specificity with hysteroscopy in diagnosing endometrial polyp and submucous fibroid. It has higher sensitivity but low specificity and low PPV in diagnosing endometrial hyperplasia. For the diagnosis of any endometrial pathology, TVS has comparable sensitivity and positive predictive value with hysteroscopy, hence can be used as screening test. Expertise of the sonologist will reduce the false positives and false negatives and increase the accuracy.

References

1. Lasmar RB, Dias R, Barrozo PR, Oliveira MA, Coutinho

ES, Daniela BR. Prevalence of hysteroscopic finding and histologic diagnosis in patients with abnormal uterine bleeding. Fertil Steril. 2008;89:1803-7.
2. Clark T, Bakour SH, Gupta JK, Khan KS. Evaluation of outpatient hysteroscopy and ultrasonography in the diagnosis of endometrial disease. Obstet Gynecol. 2002;99:1001-7.
3. Telner DE, Jakubovicz D. Approach to diagnosis and management. Can Fam Phys. 2007;53:58-64.
4. Dubinsky TJ, Parvey HR, Maklad N. The role of transvaginal sonography and endometrial biopsy in the evaluation of peri and postmenopausal bleeding. Am J Roentgenol. 1997;169:145-9.
5. Karlsson B, Granberg S, Wikland M. Transvaginal ultrasonography of the endometrium in women with postmenopausal bleeding: a Nordic multicentre study. Am J Obstet Gynecol. 1995;172:1488-94.
6. Breitkopf D, Frederickson R, Snyder R. Detection of benign endometrial masses by endometrial stripe measurement in premenopausal women. Obstet Gynecol. 2004;104:120-5.
7. Prentice A. When does heavy flow merit treatment? Practitioner. 2000;244:179-82.
8. Grimbizis GF, Tsolakidis D, Mikos T, Anagnostou E, Asimakopoulos E, Stamatopoulos P, *et al*. A prospective comparison of transvaginal ultrasound, saline infusion sonohysterography, and diagnostic hysteroscopy in the evaluation of endometrial pathology. Fertil Steril. 2010;94:2720-5.
9. Elkhayat W, Ehab SM, Yassen ME. Comparative study of transvaginal sonography and hysteroscopy for the detection of pathological endometrial lesions in women with perimenopausal bleeding. Middle East Fertility Soc J. 2011;16:77-82.
10. Niknejadi M, Haghighi H, Ahmadi F. Diagnostic accuracy of transvaginal sonography in the detection of uterine abnormalities in infertile women. Iran J Radiol. 2012;9:139-144.
11. Bingol B, Gunenc MZ, Gedikbasi A, Guner H, Tasdemir S, Tiras B. Comparison of diagnostic accuracy of saline infusion sonohysterography, transvaginal sonography and hysteroscopy in postmenopausal bleeding. Arch Gynecol Obstet. 2011;284:111-7.
12. B TV, Shivalingaiah N. Role of transvaginal sonography and diagnostic hysteroscopy in abnormal uterine bleeding. J Clin Diagn Res. 2014;8:OC06-OC08.
13. Chawla I, Tripathi S, Vohra P, Singh P. To evaluate the accuracy of saline infusion sonohysterography (SIS) for evaluation of uterine cavity abnormalities in patients with abnormal uterine bleeding. J Obstet Gynaecol India. 2014;64:197-201.
14. Wanderley, Miriam da Silva, Álvares Miriam Monteiro, Vogt Maria de Fátima Brito, Sazaki Lizandra Moura Paravidine. Accuracy of Transvaginal Ultrasonography, Hysteroscopy and Uterine Curettage in Evaluating Endometrial Pathologies. Revista Brasileira de Ginecologiae Obstetrícia. 2016;38:506-511.