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Original Research Article

Comparison of transvaginal sonography with hysteroscopy and correlation with histopathological report in case of abnormal uterine bleeding

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ABSTRACT

Background: Abnormal uterine bleeding (AUB) is change in frequency of menses, duration of flow or amount of blood loss. The objectives of the present study were to determine and compare the diagnostic accuracy of TVUS (Transvaginal ultrasonogrphy) with hysteroscopy for diagnosis of endometrial and intramyometrial pathology in case of abnormal uterine bleeding, to study the correlation with histopathological report of endometrial biopsy

Methods: It was a prospective comparative study. 200 cases of AUB were selected from June 2010 to May 2012 attending Gynaecology OPD in tertiary care level public sector teaching hospital at Mumbai, meeting the selection criteria were enrolled into the study. Complete history, detail general, systemic and local examination was performed for all patients. Two-dimensional transvaginal ultrasonography was performed to see for endometrial or intramyometrial pathology. Endometrial thickness was noted for all patients. Hysteroscopy and D&C was performed within 48 hours of ultrasonography. After hysteroscopy, curettage was performed and sent for histopathological examination.

Results: TVUS detected, 19 polyps (9.5%) and 81 myomas. It was able to differentiate these myomas as 64 interstitials (32%) and 17 submucous (8.5%) hysteroscopy detected 26 submucous myomas (13%), 31 polyps (15.5%), endometrial hyperplasia detected by TVUS, 19 in premenopausal and 06 in postmenopausal age group. Hysteroscopy detected 24 in premenopausal and 06 in post-menopausal age group. Histopathology of endometrial biopsy it came positive for 13 in premenopausal and 08 in postmenopausal age group. Two cases of CA endometrium were diagnosed on HPE out of which one was diagnosed by TVUS and same was diagnosed by hysteroscopy.

Conclusions: TVUS has significantly lower sensitivity but comparable specificity with hysteroscopy in diagnosing endometrial polyp and submucous fibroid, comparable sensitivity and specificity in diagnosing endometrial hyperplasia, equivalent sensitivity and specificity in diagnosing endometrial carcinoma, accuracy of TVUS for detecting pathology in AUB is comparable to hysteroscopy, suitable for developing countries as first diagnostic step for AUB.

Keywords: AUB, Hysteroscopy, TVUS

INTRODUCTION

Abnormal uterine bleeding (AUB) is change in frequency of menses, duration of flow or amount of blood loss. It is a common gynaecological problem. Up to 33% of women referred to Gynaecological outpatient clinics have this problem and the proportion raises more in pre-and postmenopausal women.[1,2] This condition has enormous consequences with regard to social life, morbidity and clinical workload.[2,3] AUB may be due to various causes,

common are endometrial polyp, leiomyoma, adenomyosis, endometrial hyperplasia, ovulatory dysfunction, and endometrial carcinoma. Various diagnostic techniques have been evolved over the periods to determine the etiology of abnormal uterine bleeding like dialatation and curettage (D&C), hysteroscopy, transvaginal ultrasonography and saline infusion sonography but their sensitivity and specificity has not been compared adequately. In this study diagnostic accuracy of transvaginal sonography (TVUS) in diagnosing endometrial pathologies, and premalignant/malignant conditions compared with hysteroscopy and correlated with gold standard method of D and C.

Primary objectives

- To determine and compare the diagnostic accuracy of TVUS with hysteroscopy for diagnosis of endometrial and intramyometrial pathology in case of abnormal uterine bleeding
- Correlation with histopathological report of endometrial biopsy.

Secondary objectives

- To reduce the use of invasive procedures in diagnosis and work up of case of AUB
- To formulate noninvasive method like TVUS as a screening/diagnostic method in work up of AUB.

METHODS

This is a prospective study. In this study, 200 cases of AUB were selected from Jun 2010 to May 2012.

Inclusion criteria

- Reproductive and premenopausal women presenting with AUB
- Postmenopausal women upto age 65 years presenting with postmenopausal bleeding.

Exclusion criteria

- Pregnancy
- Patients having coagulopathy
- Women those who are unwilling

Method of study

All patients of reproductive age group, premenopausal and postmenopausal women up to 65 years age presenting with AUB from June 2010 to May 2012 were included. In the present study, 200 patients from those attending the Obstetrics and Gynecology outpatient department of the hospital were included. 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 (DM, HTN, thyroid disorders), surgical history was recorded. Detail general, systemic and local examination to record the size of the uterus, its mobility and the presence of any cervical or adnexal masses. Along with this complete blood count, coagulation profile and serum electrolytes were done for all patients.

Two-dimensional vaginal ultrasonography was performed to all patients to see for endometrial or intramyometrial pathology. We used GE LOGIC 3 PRO ultrasonography machine with TVUS probe of frequency 6 MHz and in some cases transabdominal sonography if needed was performed with curvilinear probe of frequency 3 MHz. Endometrial polyps were identified as overgrowth of endometrial gland and stroma, irregular enlarged endometrium complex. Endometrial thickness was noted for all patients. Endometrial carcinoma in postmenopausal women were identified as thickened endometrium >5 mm

- Focal irregularity and myometrial distortion
- Diffuse or partial echogenecity
- Lack of subendometrial halow.[4,5]

Endometrial hyperplasia was identified as

- Thickened endomerium in postmenopausal women >5 mm
- Thickened endometrium in premenopausal women >10 mm with inhomogenous endometrium and small cysts.[6,7]

Hysteroscopy and D&C was performed within 48 hours of ultrasonography. All patients were admitted, and all preoperative preparations were done previous night including tablet misoprostol 200 μg intravaginally. It was performed under total intravenous anaesthesia (TIVA). Patient was put in lithotomy position findings of examination under anaesthesia (EUA) were recorded. We used a rigid continuous flow panoramic hysteroscopy 25 cm in length, 2.9 mm in diameter with an outer sheath of 4 mm and a 30-degree fibro optic lens (Karl Storz, Germany). A fibro optic cable is connected to the light source and to the hysteroscope. Hysteroscopy was performed with normal saline as distention media.

Hysteroscope was inserted inside the uterus gradually after negotiating the the external os and cervical canal, once the cavity was entered, a panoramic view of the uterine cavity to exclude uterine malformations or a deformed cavity, examination was done systematically, first the fundus, anterior, posterior and lateral walls of the uterus ending by visualization of the uterotubal junctions.

If there is any intrauterine pathology detected, the shape, size and site of it was estimated. The thickness, color, vasculature and consistency of the mucous membrane

covering the uterine cavity was observed and recorded. Diagnostic criteria for endometrial hyperplasia were:

- Increased endometrial thickness
- Non-homogenous endometrial regeneration
- Increased vascularization
- Polypoid formation
- Cystic dilatation
- Necrotic areas[8]

Endometrial carcinoma

- Irregular, polylobular, delicate excrescences which are partly necrotic or bleeding,
- Vascularisation is also irregular and anarchic.[8]

Pathological lesions if any were removed and sent for HPE. After hysteroscopy, curettage was performed in four quadrants, representative endometrial sample were preserved in formalin solution and sent for histopathological examination.

RESULTS

The present study included 200 patients of abnormal uterine bleeding with age of 25-65 years, out of which 104 (52%) were from 41-50 years age, 62 (31%) were from 20-40 years age and 34 (17%) were more than 50 years of age as seen. The most common bleeding pattern was menorrhagia (56%) followed by postmenopausal bleeding (15.5%), metrorrhagia (10.5%), polymenorrhagia (10%) and polymenorrhea (8%).

Table 1: Pathological findings of TVUS and Hysteroscopy.

Pathological lesions	TVUS	Hysteroscopy	HPE
Endometrial polyp	19 (9.5%)	31 (15.5%)	33 (16.5%)
Submucous fibroid	17 (8%)	26 (13%)	-
EHP in premenopausal	19 (9.5%)	24 (12%)	13 (6.5%)
EHP in postmenopausal	06 (3%)	06 (3%)	08 (4%)
CA endometrium	01 (0.5%)	01 (0.5%)	02 (1%)

TVUS detected, 19 polyps (9.5%) and 81 myomas. It was able to differentiate these myomas as 64 interstitials (32%) and 17 submucous (8.5%). Hysteroscopy detected 26 submucous myomas (13%), 31 polyps (15.5%). Endometrial hyperplasia detected by TVUS: 19 in premenopausal and 06 in postmenopausal age group Hysteroscopy detected 24 in premenopausal and 06 in post-menopausal age group. Histopathology of endometrial biopsy it came positive for 13 in premenopausal and 08 in postmenopausal age group. Two cases of CA endometrium were diagnosed on HPE out of which one was diagnosed by TVUS and same was diagnosed by hysteroscopy.

Table 2: Diagnostic accuracy of TVUS and hysteroscopy.

Pathological lesions	Accuracy	TVUS (%)	Hysteroscopy (%)
Endometrial polyp	sensitivity	57.57	93.93
	specificity	100	100
	PPV	100	100
	NPV	92.26	98.8
Submucous fibroid	sensitivity	65.38	100
	specificity	100	100
	PPV	100	100
	NPV	95.04	100
EHP in premenopausal	sensitivity	100	100
	specificity	96.15	92.94
	PPV	68.14	56.16
	NPV	100	100
EHP in postmenopausal	sensitivity	75	75
	specificity	100	100
	PPV	100	100
	NPV	92	92
CA endomertrium	sensitivity	50	50
	specificity	100	100
	PPV	100	100
	NPV	99.5	99.5

DISCUSSION

Hysteroscopy is an important method for the diagnosis of intrauterine pathology in several gynecologic complaints including abnormal uterine bleeding. Sensitivity and specificity of hysteroscopy are high in a large series of hysteroscopies performed in postmenopausal patients (98.2%).[9]

However, diagnostic hysteroscopy is an invasive and costly procedure which may be associated with risks such as uterine perforation and ascending genito-urinary infection.[10,11] Furthermore, it provides only subjective assessment of fibroid size and indirect information regarding the depth of myometrial extension.

Transvaginal sonography has been studied as an alternative to hysteroscopy in investigation of abnormal uterine bleeding and was found to have a significantly lower sensitivity (54%) compared to hysteroscopy (79%) but a comparable specificity in premenopausal patients.[12] Ultrasound enables accurate measurement of the size of the uterine fibroids.

In present study out of 200 patients 169 (84.5%) patients were of reproductive and perimenopausal age group and 31 (15.5%) were of post-menopausal age group.

Most common bleeding abnormality was menorrhagia 56% followed by postmenopausal bleeding 15.5% in our study. The TVUS detected myoma better than

hysteroscopy whereas the endometrial hyperplasia was better in hysteroscopy, but the results were not statistically significant.

In Present study, sensitivity 57.57%, specificity 100%, positive predictive value 100% and negative predictive value 92.26% for detection of endometrial polyp by TVUS. Mukhopadhay et al found sensitivity 50% and specificity 89.6%, PPV 100% and NPV 98.67%.[13] Military hospital Rawalpindi found sensitivity 100%, specificity 97%, PPV 100% and NPV 25%.[14]

In present study sensitivity 93.93%, specificity 100%, positive predictive value, 100% and negative predictive value 98.80% for detection of endometrial polyp by hysteroscopy. Mukhopadhay et al, found sensitivity 73.43% and specificity 100%, PPV 100% and NPV 94.67%. Military hospital Rawalpindi, found sensitivity 100%, specificity 100%, PPV 100% and NPV 100% as hysteroscopy and guided biopsy was considered as gold standard.

In present study, Sensitivity 65.38%, specificity 100%, positive predictive value 100% and negative predictive value 95.04% for detection of submucosal fibroid by TVUS. Military hospital Rawalpindi, found sensitivity 100%, specificity 98%, PPV 100% and NPV 60%.

In present study Sensitivity 100%, specificity 100%, positive predictive value 100% and negative predictive value 100% for detection of sumucous fibroid by Hysteroscopy. Military hospital Rawalpindi 2009, found sensitivity 100%, specificity 100%, PPV 100% and NPV 100%.

In present study Sensitivity 100%, specificity 96.15%, positive predictive value 68.42% and negative predictive value 100% for detection of endometrial hyperplasia by TVUS, in premenopausal women and Sensitivity 75%, specificity 100%, positive predictive value 100% and negative predictive value 92% for detection of endometrial hyperplasia in postmenopausal women.

Mukhopadhay et al, found sensitivity 43.75% and specificity 95.65%, PPV 70% and NPV 88% in perimenopausal women presenting with AUB. Military hospital Rawalpindi, found sensitivity 100%, specificity 93%, PPV 79% and NPV 100%.

In present study Sensitivity 100%, specificity 92.44%, positive predictive value 54.16% and negative predictive value 100% for detection of endometrial hyperplasia by hysteroscopy in premenopausal women and sensitivity 75%, specificity 100%, positive predictive value 100% and negative predictive value 92% for detection of endometrial hyperplasia in postmenopausal women Mukhopadhay et al, found sensitivity 50%, specificity 95.78%, PPV 70% and NPV 90.36% in perimenopausal women. Military hospital Rawalpindi, found sensitivity 100%, specificity 100%, PPV 100% and NPV 100%.

In present study sensitivity 50%, specificity 100%, positive predictive value 100% and negative predictive value 99.5% for detection of endometrial carcinoma by TVUS. Military hospital Rawalpindi, found sensitivity 100%, specificity 99%, PPV 100% and NPV 33%.

In present study Sensitivity 50%, specificity 100%, positive predictive value 100% and negative predictive value 99.5% for detection of endometrial carcinoma by Hysteroscopy.

In the present study, by comparing the TVUS results against hysteroscopy we found that TVUS has significantly low sensitivity but comparable specificity in diagnosing intrauterine pathology like endometrial polyp and submucous fibroid. Better specificity in diagnosing endometrial hyperplasia than hysteroscopy and similar in CA endometrium.

CONCLUSION

Transvaginal ultrasonography

- Alternative to hysteroscopy
- Easy, noninvasive needs no anaesthesia
- Enables accurate measurement of submucous fibroid, can detect adenomyosis
- Has significantly lower sensitivity but comparable specificity with hysteroscopy in diagnosing endometrial polyp and submucous fibroid
- Comparable sensitivity and specificity in diagnosing endometrial hyperplasia
- Equivalent sensitivity and specificity in diagnosing endometrial carcinoma
- Accuracy of TVUS for detecting pathology in AUB is comparable to hysteroscope
- Suitable for developing countries as first diagnostic step for AUB
- Complementary to hysteroscopy as diagnostic tool

Hysteroscopy

- Important tool for diagnosis in AUB
- Require training and skill
- Risk -perforation, genitourinary infection
- Can only assess the uterine cavity
- Most important for diagnosis of anatomical lesions. Hysteroscopy is most specific and sensitive for diagnosis of polyp but less specific for endometrial hyperplasia
- Hysteroscopy and guided biopsy is tool of choice for screening as well as diagnostic purpose in AUB

Dialatation and Curretage

- D&C is more specific and diagnostic for endometrial hyperplasia and endometrial carcinoma
- Invasive procedure, requires anaesthesia

- Risk: infection, uterine perforation, bleeding, cervical injury
- In general, the number of D&Cs being performed has declined over the years, as it is invasive procedure and requires anaesthesia and avaibility of non-invasive comparable diagnostic modalities.

However more multicentric studies are required to formulate guidelines to recommend TVUS /Hysteroscopy as diagnostic /screening modality alternative to conventionational endometrial biopsy.

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