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Role of Hysteroscopy in Abnormal Uterine Bleeding

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Abstract: ***Background: Abnormal uterine bleeding (AUB) accounts for 33% of female patients referred to gynaecologists. Common causes of AUB include endometrial polyps, endometrial hyperplasia, submucous fibroids and anovulation. Accurate diagnosis of the cause of AUB can reduce the frequency of hysterectomy. This study was aimed at assessing the usefulness of TVS in comparison with hysteroscopy in AUB evaluation. Methods: 60 female patients with AUB were enrolled in the study. Each patient was subjected to TVS where uterine cavity was studied in detail and hysteroscopy under anaesthesia using saline as distension medium. Sensitivity, specificity and predictive value of TVS as compared to hysteroscopy were calculated. Results: Menorrhagia was the commonest presenting symptom in the study population (56%). By comparing the hysteroscopy results with TVUS we found that TVUS has significantly low sensitivity (57%) but comparable specificity(100%) in diagnosing intrauterine pathology like endometrial polyp and submucous fibroid, lesser specificity(85%) in diagnosing endometrial hyperplasia than hysteroscopy. Conclusion: TVS is recommended as first line investigation in AUB. Hysteroscopy is recommended gold standard for intra cavitatory pathologies.***

Keywords: Abnormal uterine bleeding, Transvaginal sonography, Hysteroscopy, Endometrial polyp, Submucous fibroid

1. 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 increases 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 period to determine the etiology of abnormal uterine bleeding like dilatation and curettage (D&C), hysteroscopy, transvaginal ultrasonography and saline infusion sonography.

Dilatation and curettage (D&C) refer to the dilatation of the cervix and surgical removal of endometrial tissue or contents of the uterus by scraping and scooping (curettage) and subsequently products are sent for histopathological examination to rule out premalignant and malignant conditions like endometrial hyperplasia and endometrial carcinoma. D&C are commonly performed for the diagnosis of a gynecological conditions leading to abnormal uterine bleeding. It is also used as treatment for some conditions such as small polyps, incomplete abortion and heavy bleeding after child birth (4)**.** Diagnostic or therapeutic D&C has risk of complications that may arise from either the introduction or spreading infection, bleeding, adverse reaction to general anesthesia required during the surgery or from instrumentation itself and uterine perforation by sharp curettage, as the procedure is performed blindly. That is why Trans vaginal ultra sonography (TVUS) and hysteroscopy are valid alternatives to D&C for diagnosing and treating uterine pathology. It is less risky due to the ability of the doctor to view inside the uterus during surgery, unlike the blind D&C (5).

Hysteroscopy is a procedure that allows a doctor to look inside the uterus. There are two types of hysteroscopy. Diagnostic hysteroscopy can be performed as an outpatient procedure. Operative hysteroscopy is similar to diagnostic hysteroscopy but with pair of fine scissors or biopsy forceps can be placed into the uterine cavity through hysteroscope**.** During hysteroscopy, a lighted viewing instrument (hysteroscope) is inserted through the cervix and into the uterus**.** Hysteroscopy is done to examine the cervaical canal and endometrial lining, help collect a biopsy sample and guide surgery to remove growth in the uterus. Hysteroscopy as an outpatient procedure is an important method for diagnosis of AUB. This technique has replaced the dilatation and curettage (D&C), which is a blind technique with a high diagnostic failure rate (6,7). Although the major role of out-patient hysteroscopy in the management of AUB is diagnostic, there is scope for simple operative procedures such as polypectomy and targeted endometrial biopsy. Transvaginal ultrasonography (TVUS) is a non invasive method used as diagnostic method in the investigation of AUB. Pelvic ultrasound has been demonstrated as an excellent tool for diagnosing uterine pathologies, such as uterine congenital anomalies, myoma, adenomyosis, benign endometrial pathology and endometrial cancer (8)**.** Transvaginal ultrasound is a cost minimizing screening tool for premenopausal and postmenopausal women with vaginal bleeding. Its use decreases the need for invasive diagnostic procedures for women with AUB. Vaginal sonography is preferred over biopsy of postmenopausal women with vaginal bleeding because it is a less invasive procedure, generally painless, has no complications and may be more sensitive for detecting carcinoma than blind biopsy (9).

Various diagnostic techniques have been evolved over the periods to determine the etiology of abnormal uterine bleeding but their sensitivity and specificity has not been

compared adequately. In this study diagnostic accuracy of hysteroscopy in diagnosing endometrial pathologies, and premalignant/malignant conditions compared with transvaginal sonography (TVUS) and correlated with D and C.

2. Method of Study

All patients of reproductive age group, and postmenopausal women presenting with AUB from Aug 2014 to Jul 2016 were included. In the present study, 60 patients from those attending the Obstetric & Gynecology outpatient department of the hospital were included. For all patients name, address other personal and clinical details were recorded. Complete history incuding detailed menstrual history was taken as regards onset, course, duration, amount of bleeding, medical history (DM, HTN, thyroid disorders), surgical history were 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, serum electrolytes and thyroid function tests were done for all patients.

Vaginal ultrasonography was performed on all patients to see for endometrial or intramyometrial pathology. Endometrial polyps were identified as overgrowth of endometrial gland and stroma, irregular enlarged endometrium complex. Endometrial thickness was noted for all patients. Endometrial carcinomas in postmenopausal women were identified as

1) Thickened endometrium >5mm
2) Focal irregularity and myometrial distortion
3) Diffuse or partial echogenecity
4) Lack of subendometrial halo

Endometrial hyperplasia were identified as
1.Thickened endomerium in postmenopausal women >4mm
2.Thickened endometrium in premenopausal women >10mm (33) with in homogenous endometruim and small cysts

Hysteroscopic examination was done on 10th post menstrual day wherever possible except in those cases where menstrual cycles were grossly irregular or patient presented with continuous P/V bleeding. All patients were admitted and all preoperative preparations were done including tablet misoprostol 200 µg sublingually one hour before procedure. It was performed under paracervical block. Patient was put in lithotomy position findings of examination under anaesthesia (EUA) were recorded. We used a rigid continuous flow panoramic hysteroscope 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 fibre optic cable was 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 through 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 was obtained. 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
1) Increased endometrial thickness
2) Non-homogenous endometrial regeneration
3) Increased vascularisation
4) Polypoid formation
5) Cystic dialatation
6) Necrotic areas

Endometrial carcinoma were
1) Irregular, polylobular, delicate excrescences which are partly necrotic or bleeding,
2) Vascularisation is also irregular and anarchic.

Pathological lesions if any were removed and sent for HPE. At the end of the procedure, the hysteroscope was slowly withdrawn through the cervical canal.

After hysteroscopy, Curettage was performed in four quadrant, representative endometrial sample were preserved in formalin solution and sent for histopathological examination.

3. Observations and Results

Table 1: Age distribution

Age	No	%
20 -40 yrs	19	31.0
41 -50 yrs	31	52.0
>50 yrs	10	17.0

The present study included 60 patients of abnormal uterine bleeding with age of 25 - 65 yrs, out of which 31 (52%) were from 41 – 50 yrs age, 19 (31%) were from 20 – 40 yrs age and 10 (17%) were more than 50 yrs of age as seen in Table 1.

Table 2: Bleeding abnormality

Bleeding pattern	No	%
Menorrhagia	34	56
Oligomenorrhagia	6	10.5
Polymenorrhea	5	8
Polymenorrhagia	6	10
Postmenopausal bleeding	9	15.5

The most common bleeding pattern was menorrhagia (56%) followed by postmenopausal bleeding (15.5%), metrorrhagia (10.5%), polymenorrhagia (10%) and polymenorrhea (8%) as seen in Table 2.

Table 3: Endometrial Polyps and fibroid detected by TVUS (N=60)

Pathological lesion	Positive	Negative
Endometrial polyp	6 (9.5%)	54 (90.5%)
Fibroid	24 (40.50%)	36 (59.50%)
Intramural	19 (32%)	-
Submucous	5 (8.50%)	-

TVUS detected 6 polyps (9.5%) and 24 myomas (40.5%), it was able to differentiate these myomas as 19 interstitial (32%) and 5 submucous (8.5%) in relation to the endometrial encroachment as seen in Table 3.

Table 4: Endometrial polyp and submucous fibroid detected by hysteroscopy (N=60)

Pathological lesion	Positive	Negative
Endometrial Polyp	9(15.5%)	51 (84.5%)
Submucous Fibroid	8 (13%)	52 (87%)

Hysteroscopy detected 9 polyps (15.5%) and 8 myomas (13%) (all submucous) as seen in Table 4.

Table 5: TVUS - Diagnostic accuracy for endometrial polyp in comparison to HPE

A=TP=6	B=FP=0	A+B=6
C=FN=4	D=TN=50	C+D=54
A+C=10	B+D=50	A+B+C+D=60

TVUS has sensitivity 57.57%, specificity 100%, positive predictive value 100% and negative predictive value 92.26% for detection of endometrial polyp as seen above.

Table 6: TVUS - Diagnostic accuracy for submucous fibroid in comparison to hysteroscopy

A=TP=5	B=FP=0	A+B=5
C=FN=3	D=TN=52	C+D=55
A+C=8	B+D=52	A+B+C+D=60

Sensitivity 62.57%, specificity 100%, positive predictive value 100% and negative predictive value 94.54% for detection of submucosal fibroid by TVUS as seen above. Hysteroscopy is considered gold standard for diagnosing submucous fibroid.

Table 7: Hysteroscopy - Diagnostic accuracy for endometrial polyp in comparison to HPE

A=TP=9	B=FP=0	A+B=9
C=FN=01	D=TN=50	C+D=51
A+C=10	B+D=50	A+B+C+D=60

Hysteroscopy has sensitivity 90%, specificity 100%, positive predictive value 100% and negative predictive value 98% for detection of endometrial polyp as seen above.

Table 8: Hysteroscopy - Diagnostic accuracy for submucous fibroid in comparison to HPE

A=TP=8	B=FP=0	A+B=8
C=FN=0	D=TN=52	C+D=52
A+C=8	B+D=52	A+B+C+D=60

Hysterectomy has 100% Sensitivity, specificity, positive predictive value and negative predictive valuefor detection of submucous fibroid and considered gold standard.

Table 9: Endometrial hyperplasia detected by TVUS, hysteroscopy and HPE

Age group	TVS	Hysteroscopy	HPE
Premenopause (N=50)	8	6	2
Postmenopause (N=10)	01	01	01

Endometrial hyperplasia detected by TVUS - 08 in premenopausal and 01 in postmenopausal age group, while hysteroscopy detected 06 in premenopausal and 01 in post menopausal age group, after confirming by histopathology of endometrial biopsy it came positive for 02 in premenopausal and 01 in postmenopausal age group as seen in Table 9.

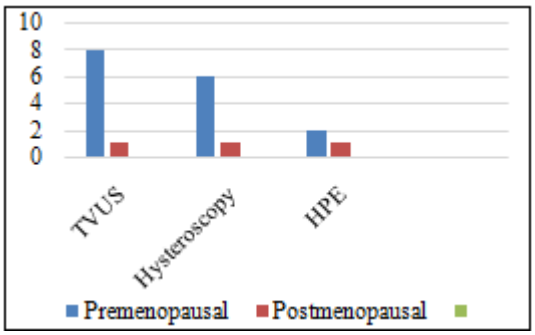

Figure 1: Endometrial hyperplasia detected by TVUS, Hysteroscopy and HPE

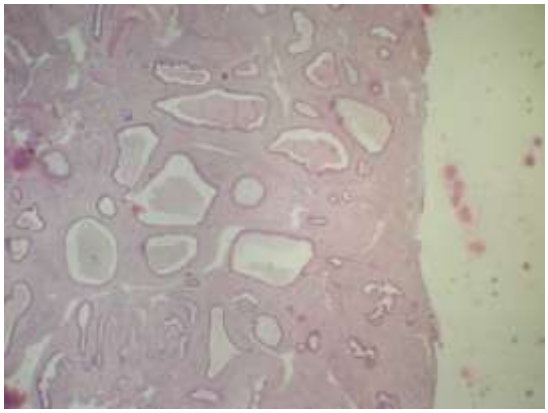

Figure 2: Simple cystic endometrial hyperplasia

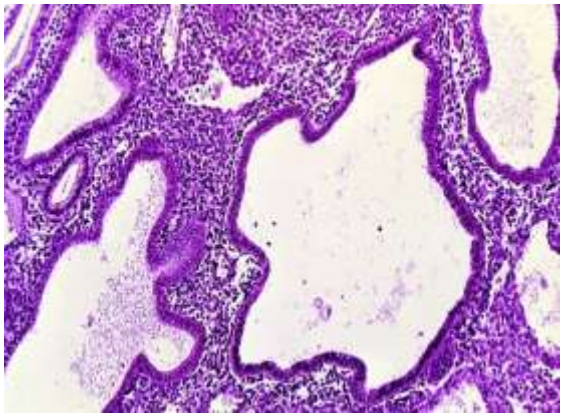

Figure 3: Cystic glandular hyperplasia

Table 10: TVUS – Diagnostic accuracy for endometrial hyperplasia in premenopausal women in comparison to HPE

A=TP=8	B=FP=6	A+B=14
C=FN=0	D=TN=36	C+D=36
A+C=8	B+D=42	A+B+C+D=50

TVUS has Sensitivity 100%, specificity 85.71%, positive predictive value 57% and negative predictive value 100% for detection of endometrial hyperplasia in premenopausal women as seen above.

Table 11: TVUS - Diagnostic accuracy for endometrial hyperplasia in postmenopausal women in comparison to HPE

A=TP=1	B=FP=0	A+B=1
C=FN=0	D=TN=9	C+D=9
A+C=1	B+D=9	A+B+C+D=10

As only one case of EHP in postmenopausal women was detected so sensitivity and specificity of TVUS in evaluation of EHP in Postmenopausal women can not be commented.

Table 12: Hysteroscopy - diagnostic accuracy for endometrial hyperplasia in premenopausal women in comparison to HPE

A=TP=6	B=FP=4	A+B=10
C=FN=0	D=TN=40	C+D=40
A+C=6	B+D=44	A+B+C+D=50

TVUS has Sensitivity 100%, specificity 90.90%, positive predictive value 60%
and negative predictive value 100% for detection of endometrial hyperplasia in premenopausal women as seen above.

Table 13: Hysteroscopy - Diagnostic accuracy for EHP in postmenopausal women in comparison to HPE

A=TP=1	B=FP=0	A+B=1
C=FN=0	D=TN=9	C+D=9
A+C=1	B+D=9	A+B+C+D=10

As only one case of EHP in postmenopausal women was detected so sensitivity and specificity of hysteroscopy in evaluation of EHP in Postmenopausal women can not be commented. No cases of Carcinoma endometrium were diagnosed by HPE.

Table 14: Pathological findings of TVUS and Hysteroscopy

Pathological lesions	TVS	Hysteroscopy	HPE
Endometrial polyp	06 (9.5%)	09 (15.5%)	10 (16.5%)
Sub Mucous Fibroid	05 (8%)	08 (13%)	08(13%)
EHP in Premenopausal	08 (13%)	06 (9.5%)	02 (6.5%)
EHP in Postmenopausal	01 (3%)	01(3%)	01(3%)

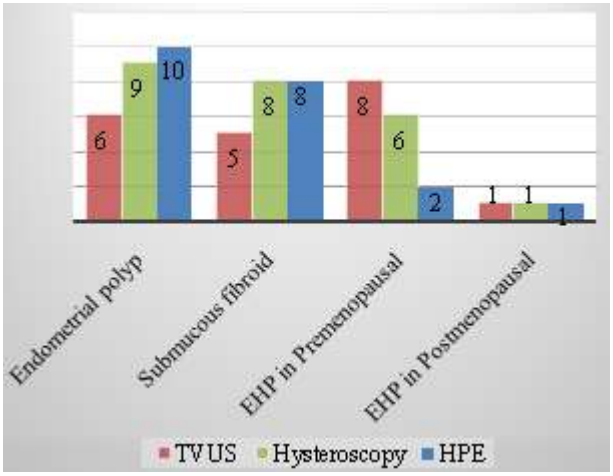

Figure 4: Pathological findings of TVUS and Hysteroscopy compared with histopathology

4. Conclusion and Summary

In present study out of 60 patients 50 (83.5%) patients were of reproductive and perimenopausal age group and 10 (16.5%) were of post menopausal age group (Table 1). Most common bleeding abnormality was menorrhagia 56% This study showed good overall agreement between diagnostic hysteroscopy and TVUS in the diagnosis of uterine abnormalities. TVUS detected, 6 polyps (9.5%) and 24 (40%) myomas. It was able to differentiate these myomas as 19 interstitial (32%) and 5 submucous (8.5%) (Table 3). Hysteroscopy detected 8 submucous myomas (13%), 9 polyps (15.5%) (Table 4). Endometrial hyperplasia detected by TVUS - 08 in premenopausal and 01 in postmenopausal age group, while hysteroscopy detected 06 in premenopausal and 01 in post menopausal age group, after confirming by histopathology of endometrial biopsy it came positive for 02 in premenopausal and 01 in postmenopausal age group (Table 9).

In the present study, by comparing the TVUS results with hysteroscopy we found that hysteroscopy has significantly high sensitivity but comparable specificity with TVUS in diagnosing intrauterine pathology like endometrial polyp and submucous fibroid, comparable sensitivity and specificity in diagnosing endometrial hyperplasia in premenopausal age group.

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