



COMPARISON OF TRANSVAGINAL SONOGRAPHY AND HYSTEROSCOPY WITH HISTOPATHOLOGY OF ENDOMETRIUM IN EVALUATING ABNORMAL UTERINE BLEEDING

Obstetrics & Gynaecology

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ABSTRACT

Background: Abnormal uterine bleeding (AUB), is a common condition affecting women across all age groups, necessitating accurate etiological diagnosis for appropriate management. Technological advancements have established transvaginal sonography and diagnostic hysteroscopy as valuable adjuncts to conventional blind endometrial curettage. **Methods:** This prospective comparative study was conducted at the Institute of Maternal and Child Health, Government Medical College, Kozhikode, from January 2019 to June 2020. It involved 50 patients with AUB, including premenopausal and postmenopausal women aged 40 to 55, presenting with heavy menstrual bleeding, intermenstrual bleeding, or postmenopausal bleeding. Patients with a uterine size less than 12 weeks gestation were included, while those with acute pelvic infections or coagulopathy were excluded. After obtaining Informed written consent and history, physical examination, ultrasonography and hysteroscopy were performed on each patient. Endometrial curettage and biopsy specimens were sent for histopathological analysis. Results were statistically analysed to assess the diagnostic accuracy of transvaginal sonography (TVS) and hysteroscopy in comparison to histopathology. **Results:** In identifying endometrial hyperplasia, Transvaginal sonography has 78% accuracy with a 77.5% sensitivity and 100% specificity whereas Hysteroscopy has 98% accuracy with a sensitivity of 97.90% and specificity of 100%. For intracavitary lesions Hysteroscopy is 100% accurate and transvaginal sonography has varying accuracy of 68% for endometrial polyp and 92% for submucous fibroid. **Conclusion:** Ultrasonography being easily available and relatively cheap and non-invasive should be the first diagnostic test in the evaluation of AUB. Hysteroscopy has very high sensitivity in detecting intracavitary lesions.

KEYWORDS

Hysteroscopy; Transvaginal Ultrasonography; Histopathological Examination; Abnormal Uterine Bleeding.

INTRODUCTION

AUB is defined as any deviation from the normal menstrual cycle. This includes change in regularity, frequency, duration, or amount of bleeding during or in between periods (Fraser et al., 2011). AUB is responsible for 20-30% of patients who attend gynaecology outpatient department amongst women in reproductive age group and 50% in a perimenopausal women, significantly impacting quality of life and imposing financial burden.

Various diagnostic techniques have been evolved over the periods to determine the aetiology of abnormal uterine bleeding like dilatation and curettage (D&C), transvaginal ultrasonography, saline infusion sonography but their sensitivity and specificity has not been compared adequately. Until recent times, usual method of evaluating this symptom was dilatation and curettage but this detects the cause in less than 50% of the cases (Patil S et al., 2009). Hysteroscopy can improve the diagnostic accuracy and can permit better treatment of uterine disease. Use of hysteroscopy in abnormal uterine bleeding is almost replacing the blind curettage. Hysteroscopy provides simple and easy method for visualization of uterine cavity and helps in directed biopsy from specified site. In fact, it is an eye in the uterus (Tarneja & Duggal, 2011). Transvaginal sonography allows detailed assessment of anatomical abnormalities of the uterus and endometrium. In addition, pathologies of the myometrium cervix tubes and ovaries can be assessed.

The invasive nature and high cost of hysteroscopy preclude its use as a primary diagnostic modality in patients with AUB. Although TVS is a simple examination, ability of transvaginal sonography for screening the lesions within the endometrial cavity is limited. Hysteroscopy when combined with directed endometrial biopsy has high sensitivity and specificity in identifying benign and malignant lesions (Gimpelson & Rappold, 1988). Hysteroscopy is more accurate in detecting intracavitary lesions such as fibroids and polyps than blind biopsy alone (Bradley, 2002). To diagnose a case of AUB the modalities available in the armamentarium of a gynaecologist should be judiciously used.

Aim

To compare the diagnostic efficacy of Transvaginal sonography and hysteroscopy with histopathology of the endometrium in evaluating

perimenopausal bleeding.

MATERIALS AND METHODS

This was a prospective and comparative study conducted in Department of Obstetrics and Gynaecology, Government medical college Kozhikode from Jan 2019 to June 2020. This study had 50 patients with AUB. Women in the perimenopausal and postmenopausal age group (40-70 years) were included in the study. Those with bleeding disorders and acute pelvic infection were excluded. After getting approval from institutional ethical committee, Informed consent was taken from all the patient subjected to the study. Detailed clinical history was taken and thorough systemic and gynaecological examination was done in all the patients. Complete blood count, bleeding time, clotting time, urine routine examination, TSH, Screening for HIV, HBsAg, VDRL, HCV, Blood grouping and Rh typing were done in all patients

All patients were subjected to transvaginal ultrasound to note down the endometrial thickness and to rule out other uterine and adnexal pathology. Then we performed diagnostic hysteroscopy in them. Hysteroscopy findings were documented, and this was followed by curettage of endometrium and removal of submucous fibroid or endometrial polyp if present. All the specimens were sent for histopathological examination. Final diagnosis was the diagnosis applied after histopathological results were received. Histopathological reports of the endometrial curettage and biopsied specimen were correlated with ultrasonographic and hysteroscopy findings and specificity and sensitivity of each test were calculated.

RESULTS

From each patient demographic data, chief complaints, TVS findings, hysteroscopic findings were tabulated. Comparison between the two diagnostic procedure was done. The accuracy was calculated in relation to the histopathological diagnosis. In the present study majority of patients belongs to the age group of 51-55 (46%). Majority were multipara - 78%, 39 cases. Remaining were primipara (22%). The most common presenting complaint among the patients was heavy menstrual bleeding (60%) followed by intermenstrual bleeding and postmenopausal bleeding. The most common indication for hysteroscopy was heavy menstrual bleeding. Dysmenorrhea, 42% was the commonest associated symptom. Lower abdominal pain

constitutes 40% and discharge per vaginum 26%. Majority of patients presented to hospital only after 6 months to one year of onset of symptoms. 50% of AUB patients has associated medical comorbidity. Majority of them had Type 2 DM (26%), 20% of them were hypertensive and 2 patients had Bronchial Asthma. 10% of the patients have a BMI greater than 30kg/m² and 58% of them have a BMI between 20 kg/m² and 24.9 kg/m². 64% of the patients had anaemia, out of which 12% had haemoglobin level less than or equal 8gm/dl.

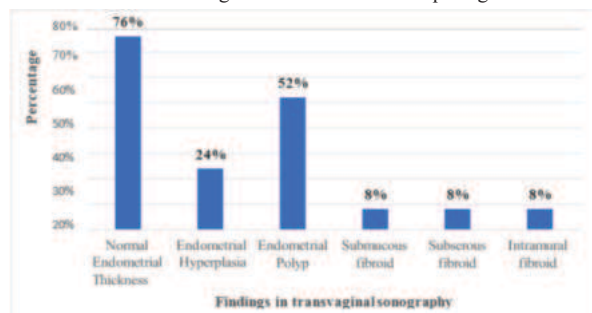


Figure 1: Findings in transvaginal sonography

Table 1: Endometrial Thickness (mm) in TVS

Sl No.	Endometrial Thickness	Frequency		Percent age
		Premenopausal	Postmenopausal	
1	4 to 7.9mm	26	5	62
2	8 - 12 mm	12	4	32
3	More 12mm	2	1	6
	Total	40	10	100

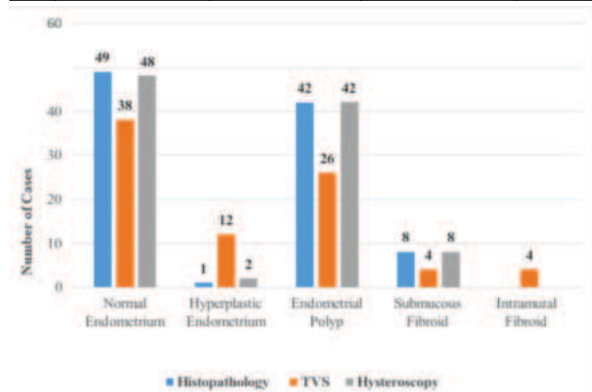


Figure 2: Comparison of three different procedures

Table 2: Diagnostic Value of Transvaginal Sonography in Comparison to Histopathology

Diagnostic value of Transvaginal Sonography in Comparison to Histopathology					
TVS Findings	Sensitivity	Specificity	PPV	NPV	Accuracy
Endometrial Thickness	77.5%	100%	61.9%	8.3%	78%
Endometrial Polyp	90.50%	82.80%	79.20%	92.30%	68%
Submucous Fibroid	50%	100%	100%	91.30%	92%

Transvaginal sonography (TVS) has 77.5% sensitivity, 100% specificity with an accuracy of 78% in identifying endometrial hyperplasia. In identifying intracavitary lesions TVS has varying accuracy of 68% for endometrial polyp and 92% for submucous fibroid.

Table 3:- Diagnostic Value of Hysteroscopy in Comparison to Histopathology

Diagnostic value of hysteroscopy in comparison to Histopathology					
Hysteroscopy Findings	Sensitivity	Specificity	PPV	NPV	Accuracy
Endometrial Thickness	97.90%	100%	100%	91.3%	98%
Endometrial Polyp	100%	100%	100%	100%	100%
Submucous Fibroid	100%	100%	100%	100%	100%

DISCUSSION

In this prospective study, conducted in Institute of maternal and child

health, Government Medical College, Kozhikode we have compared TVS and hysteroscopy with histopathology reports in 50 cases of abnormal uterine bleeding admitted from January 2019 to June 2020 in perimenopausal and post-menopausal age group (40-55 years). In the present study, perimenopausal and post-menopausal females in the age group (40-55 years) were included and majority of patients belong in the age group 45-50 years. In a study conducted by Kathuria et al (Kathuria & Bhatnagar, 2014) evaluating 50 patients between the age group of 20-60 years and found that maximum incidence is between 30-39 years (44%). Patil S et al (Patil et al., 2009) conducted similar study on a total of 100 patients of age group more than 18 years with AUB were evaluated and found that abnormal uterine bleeding was most prevalent among women of two age groups 26-30 years and 41-45 years (22%). The study showed a different prevalence profile than the above studies as we have considered perimenopausal and postmenopausal females > 40 years of age as study population. All the population were parous females, and the commonest affected patients are with parity of 2 or more (78%). We had 39 patients with parity of 2 or more. There was no nulliparous female in the present study. The commonest presenting complaints were menorrhagia or heavy menstrual bleeding (60%) followed by intermenstrual bleeding (10%) and postmenopausal bleeding (10%). This was in consistence with many other studies, the most common symptoms in patients with abnormal uterine bleeding was menorrhagia (40%), metrorrhagia (18%) and menometrorrhagia (14%).

Bhatiyani B R et al (Bhatiyani et al., 2018) found that 60% of patients presented with menorrhagia followed by post-menopausal bleeding (12%) and followed by intermenstrual bleeding (11%). In Kathuria et al (Kathuria & Bhatnagar, 2014) series the commonest presenting complaint was menorrhagia 46%, followed by polymenorrhoea (30%) and menorrhagia (18%) and post-menopausal bleeding in 6%. Shrinivas (Srinivas, 2017) concluded that 46% of patients presented with heavy menstrual bleeding, 34% had increased cycle frequency and 20% of them had presented with continuous bleeding.

Majority of the patients presented to OPD more than 6 months of onset of symptoms, which is quite late which could be because since it is a tertiary hospital majority of the patients attending our OPD are referred from peripheries. And also, in many cases we have observed that patients were given only symptomatic treatment without properly evaluating the cause of AUB. Patients are referred when symptoms become severe, hence this time lag. In study by Kathuria et al (Kathuria & Bhatnagar, 2014) found that most of the patients seek medical attention after suffering for 3-6 months' time (50%). In another study conducted by Srinivas (Srinivas, 2017), it was found that 54% present within 6 months of complaints and same was the case in a study by Bhatiyani B R et al (Bhatiyani et al., 2018) where 75% of the patients presented within 6 months of menstrual complaints. Out of 50 patients in the present study 50% had no comorbidity and other 50% had associated medical comorbidities like type 2 diabetes mellitus in 26%, hypertension in 20% and bronchial asthma in 4% cases. In a study conducted by Bhatiyani B R et al (Bhatiyani et al., 2018) showed hypertension in 9% of cases, diabetes in 5%, hypothyroidism in 3% and tuberculosis in 3% of the patients. In another study conducted by Patil S et al (Patil et al., 2009), 14% of the patients were hypertensive, 6% had history of tuberculosis, 5% were diabetic and 5% of the patients had sickle cell anaemia. Diabetes, hypertension, and obesity are risk factors for precancerous lesions of endometrium as well as for carcinoma endometrium. AUB is the presenting symptom for both of them. In our study, anaemia was present in 64% of the patients. This is similar to studies conducted by Sabherwal (Sabherwal et al., 2002), Emmanuel (Emmanuel et al., 1995) and Sheth SS (Sheth et al., 1989) which says 65%, 59.3%, and 73% respectively. So, in different studies the values are varying between 60-75%. It depends on the severity and duration of symptom (bleeding).

Ultrasonography being easily available and more feasible was done first. In the present study, Ultrasonography showed some abnormality in 76% of the cases in the form of increased endometrial thickness, or intracavitary lesions like submucous fibroid or endometrial polyp, while in the remaining 24% USG findings were normal. A similar observation is found in a study conducted by Bhatiyani B R et al (Bhatiyani et al., 2018) where USG showed some abnormality in 83% patients while in 17% patients it was normal. The most common abnormality detected in the present study was Endometrial Polyp (52%), followed by uterine fibroid (24%). This is different from study conducted by Mishra et al (Mishra & Panda, n.d.) in which the most

common uterine pathology detected by USG was fibroid uterus, consisting 18.3%, adenomyosis -10%, polyp - 7.5% and thickened endometrium. In a study done by Karlsson et al (Karlsson et al., 1994), they found that 39 out of 51 patients in their study had thickened endometrium. The most common detected pathology in ultrasonography is endometrial hyperplasia (15%), followed by fibroid uterus in a study conducted by Patil S et al (Patil et al., 2009). If saline sonography had been done in addition to TVS the diagnostic accuracy would have increased as it will delineate polyp and fibroids well.

In present study, on transvaginal sonography endometrial thickness of 4-7.9mm was seen in most of the patients (62%). 32% of the patients had endometrial thickness in the range 8-12mm, and 6% had endometrial thickness more than 12mm. In perimenopausal women, cut-off value more than 12mm and post-menopausal cut-off value more than 4mm were considered abnormal. 12 cases (10 postmenopausal and 2 premenopausal) had increased endometrial thickness. On histopathology 1 had hyperplasia 9 had endometrial polyp and 2 had submucous fibroid. Gowri M et al (Garuti et al., 2001) found that 54 cases out of 100 showed increased ET in USG (12mm in perimenopausal and ≥ 4 mm in postmenopausal). 37 had normal endometrium, 4 showed fibroid, 2 showed fibroid with hyperplasia, and 1 showed hyperplasia with polyp and 2 showed malignancy. In the present study, the final histopathological examination of the endometrium and tissue biopsy showed normal findings like proliferative endometrium, secretory endometrium, or atrophic endometrium in 98% of the cases, and abnormal findings like complex hyperplasia in 2% of the cases. Tissue biopsy report showed endometrial polyp in 84% of the cases and submucous fibroid in 16% of the cases. The endometrium was secretory in most of the cases (52%), followed by proliferative in 42% and atrophic in 2% of the cases.

In the study by Patil S et al (Patil et al., 2009), they found proliferative phase endometrium as most common finding. But Bhatiyani B R et al (Bhatiyani et al., 2018) had a similar result in which secretory phase endometrium was most common finding. The HPE of 2 out of 3 cases in post-menopausal patients showed atrophic endometrium. One case of complex hyperplasia without atypia was there. Majority of the tissue biopsy specimen were endometrial polyp (84%), followed by submucous fibroid (16%).

On hysteroscopy the endometrium appeared normally in 96% of the cases. In the remaining 2 cases, endometrium was fluffy and thickened in premenopausal age group. Meticulous curettage was done to rule out malignancy and histopathology report came as proliferative endometrium. There was one case of complex hyperplasia without atypia, which appeared to be normal on hysteroscopy. In 42 cases, projections of endometrial polyps were present, which was removed and sent for HPE. There were 8 cases of submucous fibroid, which was removed and sent for HPE. There was no case of endometrial carcinoma in the present study. In our study, it was observed that for intra cavity lesion especially uterine polyp, hysteroscopy is highly sensitive (100%). In a similar study conducted by Slimani et al (Slimani et al., 2013), sensitivity of hysteroscopy for intracavitary lesion is 93%.

Out of 49 cases reported as normal endometrium on histopathology, 12 cases were identified as normal by transvaginal sonography and 48 cases were identified as normal by hysteroscopy. There was one case of complex hyperplasia which was identified as normal by hysteroscopy as well as transvaginal sonography with an endometrial thickness of 11mm. Hysteroscopy identified two cases as hyperplastic endometrium, which turned out to be normal proliferative endometrium on histopathology. 42 out of 42 cases identified by endometrial polyp is identified by hysteroscopy. USG identified 26 cases of endometrial polyp. 8 cases of submucous fibroid were identified on hysteroscopy and same removed and sent for HPE. Out of this, 4 cases were identified as submucous fibroid on transvaginal sonography.

Panda et al (Mishra & Panda, n.d.) found that hysteroscopy diagnosed endometrial hyperplasia, polyp and myoma with a specificity of 97.3%. Sheth et al (Sheth et al., 1989) reported 81.8% accurate in diagnosing polyp and myomas while Garuti et al (Garuti et al., 2001) reported 95.4% specificity in diagnosis of polyp, present study showed that Hysteroscopy is 98% accurate in identifying endometrial

thickness with a sensitivity of 97.90% and specificity of 100% and 100% sensitivity and specificity in identifying intracavitary lesions.

Out of 12 cases identified as increased endometrial thickness in transvaginal sonography only one case turned out to have endometrial hyperplasia. Ultrasonography picked 26 out of 42 cases of polyps and 4 out of 8 cases of submucous fibroid were conclusively reported as submucous fibroid. The sensitivity, specificity, NPV, PPV of transvaginal sonography in assessing endometrial thickness is 77.5%, 100% 61.9% and 8.3% respectively with an accuracy of 78% and it has varying accuracy 68% for endometrial polyp and 92 % for submucous fibroid. Kumari M et al (Kumari & Gupta, 2015) reported a sensitivity of 63% in their study and Emmanuel et al (Emmanuel et al., 1995), Haq k et al (Haq et al., 2009) , Saidi MH et al (Saidi et al., 1997) reported sensitivity of 96%, 94% and 95% respectively. The findings in various tests in three cases are discussed below.

In 48 years old perimenopausal female who presented to us with heavy menstrual and intermenstrual bleeding for 8 months duration, when we performed a transvaginal sonography endometrial thickness was 11mm and on hysteroscopy the endometrium appeared to be normal and a thorough curettage was done to rule out malignancy. And the histopathology report came out as complex hyperplasia without atypia. She underwent hysterectomy and the final HPR came as carcinoma endometrium.

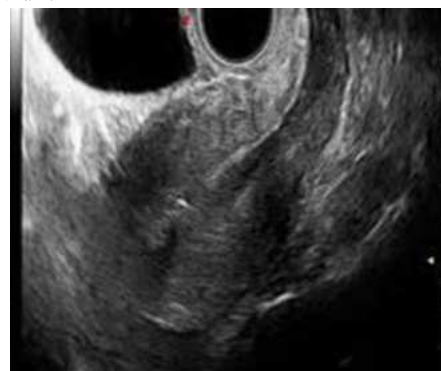


Figure 3:Endometrial Hyperplasia in TVS

In a 70-year-old post-menopausal female who presented with complaints of bleeding per vaginum 2 episodes since past 4 months, when we performed transvaginal sonography endometrial thickness was 16mm and we suspected malignancy and did hysteroscopy which showed an atrophic endometrium with 2 polyps arising from anterior wall of lower part of uterus with a feeding vessel. Same was excised and sent for histopathology and showed endometrial polyp with benign features.



Figure 4:Thickened Endometrium



Figure5: Endometrial Polyp

In another case of a 45-year-old who came with heavy menstrual bleeding with congestive dysmenorrhoea since 10 months, Ultrasonography revealed normal size uterus with anterior wall intramural fibroid 30×40 mm with an endometrial thickness of 8.5 mm. We went ahead with hysteroscopy in which uterine cavity showed 2×1cm submucous

fibroid arising from Fundus which was avulsed and removed and sent for histopathology and report came as submucous fibroid.



Figure 6: Submucous Fibroid

CONCLUSION

Transvaginal sonography is 78% accurate in diagnosing increased endometrial thickness while hysteroscopy showed 98% accuracy. For identifying intracavitary lesions hysteroscopy showed 100% accuracy while transvaginal sonography showed a varying accuracy of 68% for endometrial polyp and 92 % for submucous fibroid.

Transvaginal sonography should be the first line investigation while evaluating AUB in perimenopausal age group. Hysteroscopy is the gold standard in the diagnosis of focal pathology like submucous fibroid or polyp. Hysteroscopy has a very high sensitivity in detecting intracavitary lesions causing AUB. Histopathology is inevitable to rule out premalignant and malignant conditions. Thus, patients with AUB should be subjected to TVS as first procedure followed by hysteroscopy and hysteroscopy directed biopsy whenever necessary.

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