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Hysteroscopic evaluation of endometrial lesions in women presenting with abnormal uterine bleeding (AUB)

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Abstract
Background & Objectives: Abnormal uterine bleeding is the most common complaint in gynecology and an important source of morbidity. This study evaluates the role of diagnostic hysteroscopy in the evaluation of Abnormal Uterine Bleeding in women of reproductive age group and its histopathological correlation.
Methods: 63 patients with AUB who got admitted at MMMCH, Kumarhatti, Solan in the Department of Obstetrics and Gynaecology were subjected to transvaginal sonography, hysteroscopy and hysteroscopy guided endometrial sampling. Histopathological analysis of the endometrial sample obtained. The hysteroscopy findings were correlated with the histopathology report.
Results: AUB was more common in 40-49 yrs. The most common presenting complaint was heavy menstrual bleeding. Hysteroscopy was done successfully in all the patients. Abnormalities seen were endometrial polyps, leiomyomas, thick and thin endometrium on TVS. On hysteroscopy we found polypoidal and atrophic endometrium, endometrial polyp, submucosal fibroid. Hysteroscopy was found to be 100% sensitive and specific in diagnosis of endometrial lesions in many conditions. The positive predictive value was 100% for hysteroscopy in diagnosis of endometrial lesions.
Conclusion: We conclude that hysteroscopy is an accurate and a feasible investigation in evaluating patients with abnormal uterine bleeding and should always be incorporated as a routine for evaluating endometrial lesions along with sampling.

Keywords: Hysteroscopy, D&C, abnormal uterine bleeding, histopathology

Introduction
Any sort of vaginal bleeding whose duration, frequency, or amount is abnormal for an individual patient is referred to as abnormal uterine bleeding (AUB) [1]. It is one of the most common presenting symptoms in gynecological outpatients, affecting all age groups with more than 30% of all gynecological consultations being for this reason [2]. The reported prevalence of AUB in India is around 17.9 percent [3].
To exclude the exact cause of abnormal uterine bleeding, a thorough workup encompassing history, physical examination, and pelvic examination is required to accurately diagnose the cause of AUB. Transvaginal ultrasonography (TVS), sonosalpingography (SIS), hysteroscopy, and dilatation and curettage (D & C) are some of the diagnostic procedures offered in the gynecological armory for AUB diagnosis and work up.
For decades, dilatation and curettage (D & C) have been the gold standard for evaluating patients with abnormal uterine bleeding among the different diagnostic methods, but as it is a blind procedure with no knowledge of the specific location or the endometrial pathology, hence there is a risk of missing a small and localized lesions [4].
Ultrasonography can clearly show the uterine contour, any myometrial lesions such as fibroid, and the ovarian status, but it can't tell you much about the endometrium.
Hysteroscopy has nearly replaced traditional D&C. Direct imaging of the uterine cavity allows it to identify the origin of lesions in the vast majority of cases. It can detect endometrial hyperplasia and help detect submucosal fibroid, uterine polyps and endometrial cancer in the early stages [5-6].
The objectives of this study are to explore at the implication of hysteroscopy in the evaluation of

Abnormal Uterine Bleeding in terms of the precision of its findings and their engrossment to further management of disease.

AIMS and Objectives

AIM

To evaluate the endometrial lesions in women with AUB by hysteroscopy.

Objectives

1. To study the pattern of abnormal uterine bleeding and various endometrial lesions on transvaginal ultrasound.
2. To compare the diagnostic precision of transvaginal ultrasound with hysteroscopy.
3. To correlate the ultrasound and hysteroscopy diagnosis of endometrial lesions with histopathological examination.

Materials and Methods

Study Design: It is a hospital based cross-sectional, analytical study.

Study Setting

This prospective study was carried out in Maharishi Markandeshwar Medical College & Hospital, Kumarhatti, solan over the period of 18 months from November 2019 to May 2021, after the approval given by institutional ethical committee.

Sample Size

The study was conducted on 63 women (min required was 50) after fulfilling the study criteria.

Inclusion Criteria

1) All women attending gynecology OPD with AUB more than 18 years of age in the study period.

Exclusion Criteria

1. Known/Suspected pregnancy.
2. Active pelvic infection.
3. Cervical cancer.
4. Medically unfit for hysteroscopy.
5. Not giving consent.
6. Abandoned or incomplete procedure.

Collection and processing of samples

A thorough history was taken as per the proforma from women chosen for the study. All the study subjects were analyzed in detail regarding age, literacy, socio-economic status, parity, menstrual history etc as per proforma. Subjects were followed further by thorough general physical examination and gynecological examination. All patients were subjected to routine blood investigations required for pre-anesthetic check up. Transvaginal sonography (TVS) was performed in OPD on all patients prior to hysteroscopy. After getting anesthetists fitness patient was taken up for hysteroscopy. D&C was done in all under hysteroscopic guidance and sample collected was sent for histopathology examination.

Observations and Results

The present study was aimed to evaluate intrauterine abnormalities in symptomatic AUB patients presenting to the OPD by Transvaginal sonography and hysteroscopy and correlating the diagnosis with histopathology. A total of 63 patients were included in the study over a period of one and half years.

Table 1: Distribution according to age

Age	Frequency	Percent
18-29	13	20.6
30-39	17	27.0
40-49	19	30.2
>=50	14	22.2
Total	63	100.0

In the present study, maximum number of subjects were from age group of 40-49 years i.e, 19/63 (30.2%) followed by 30-39 years i.e, 17/63 (27.0%).

Table 2: Distribution according to Parity-

Parity	Frequency (N= 63)	Percent
0	22	34.9
1	7	11.1
2	18	28.6
3	9	14.3
4	3	4.8
5	3	4.8
6	1	1.6
Total	63	100.0

In our study maximum number of subjects were nulliparous i.e., 22/63 (34.9%) followed by parity 2 (28.6%) and 3 (14.3%).

Table 3: according to clinical presentation

Presentation	frequency(n)	Percentage
Heavy menstrual bleeding	32	50.8
Frequent cycles	15	23.8
Prolonged cycles	5	7.9
Postmenopausal bleeding	11	17.5
Total	63	100.0

In our study maximum number of subjects presented with of heavy menstrual bleeding i.e 32/63 (50.8%) followed by frequent cycles (23.8%).

Table 4: according to TVS findings

Findings	Number of subjects	Percentage
• Submucous fibroid	3	4.7
• Polyp	9	14.2
Endometrial thickness		
✓ Normal (4-12 mm)	45	63.49
✓ Thick (> 12 mm)	14	22.2
✓ Thin (< 4mm)	4	6.3
• Endometrial growth	0	0

In present study, when transvaginal sonography was done, we found maximum number of subjects had normal endometrial thickness (4-12mm) i.e., 45/63 (63.49%) followed by thickened endometrium in 22.2%. We also found submucosal fibroid in 3 subjects (4.7%) and endometrial polyps in 9 subjects (14.2%).

Table 5: According to Hysteroscopy findings

Hysteroscopy finding	Subjects	Percentage
Normal endometrium	41	65.07

Polypoidal endometrium	13	20.63
Atrophic endometrium	9	14.28
Submucosal fibroid	1	1.58
Endometrial polyp	13	20.63
Intrauterine adhesions	4	6.3
Endometrial growth or malignancy	0	0

In the present study when hysteroscopy was performed, maximum number of subjects had normal endometrium i.e 41/63 (65.07%) followed by polypoidal endometrium in 13 subjects and atrophic endometrium in 9 subjects. We also found submucosal fibroid in 1 subject (FIGO 0) and endometrial polyps in 13 subjects.

Table 6: According to Histopathological findings

Findings	Frequency	Percent
Proliferative endometrium	24	38.09
Secretory endometrium	18	28.6
Disordered proliferative endometrium	12	19.04
Atrophic endometrium	3	4.76
Hyperplasia without atypia	4	6.34
Endometritis	3	4.76
Endometrial Polyp	15	23.8

When Histopathological examination of endometrial sampling was done, we found maximum number of subjects had proliferative endometrium in 38.09% followed by secretory endometrium in 28.6% (abnormal pattern for proliferative phase). We also found endometrial polyp in 15 subjects, atrophic endometrium in 3 subjects, hyperplasia without atypia in 4 subjects and endometritis in 3 subjects.

Table 7: Correlation of Transvaginal Ultrasound versus Hysteroscopy

Findings on TVS	Proliferative Endometrium	Secretory Endometrium	DPE	atrophic	H Without A	Polyp	endometritis	Fibroid
Normal Endometrium	20	13	6	1	2	5	3	0
Thick endometrium	3	5	6	0	2	3	0	0
Thin	1	0	0	3	0	5	00	0
Submucosal Fibroid	0	0	0	0	0	0	0	1
Polyp	0	0	0	0	0	2	0	0

On TVS, 45 subjects showed normal endometrial thickness however on HPE showed 20 (44.4%) subjects had proliferative endometrium, 13 (28.8%) had secretory endometrium (abnormal pattern for that phase of menstrual cycle), 6 (13.3%) had disordered proliferative endometrium. 2(4.44%) subjects with normal endometrial thickness on TVS, showed hyperplasia without atypia on HPE, 4 (8.88%) subjects showed polyps and 3 (6.66%) had endometritis in the report.

Out of 14 subjects having thickened endometrium on TVS, HPE reports showed 3 (21.4%) having proliferative endometrium, 5 (35.7%) secretory endometrium, 6 (42.8%) disordered proliferative endometrium, 2(14.2%) hyperplasia without atypia and 2(14.2%) reports showed polyp.

Those with thin endometrium on TVS, had HPE suggesting proliferative endometrium 1 (25%), had atrophic endometrium3 (75.0%) and polyp in 2 (50.0%).

Table 8: Correlation of Hysteroscopy versus Histopathology

Findings on Hysteroscopy	Proliferative endometrium	Secretory endometrium	DPE	Atrophic endometrium	H Without A	Polyp	Endometritis	fibroid
Normal Endometrium	22	13	3	2	1	5	1	0
Polypoidal Endometrium	1	5	6	0	1	2	0	0
Atrophic endometrium	1	0	3	2	2	4	2	0
Submucosal Fibroid	0	0	0	0	0	0	0	1
Endometrial Polyp	0	0	0	0	0	4	0	0
Intrauterine Adhesions	2	2	0	0	0	0	0	0
Endometrial growth or malignancy	0	0	0	0	0	0	0	0

On hysteroscopy 41 subjects showed normal endometrium and HPE showed 22 (53.6 percent) had proliferative endometrium, 13 (31.7 percent) had secretory endometrium, 3 (7.3 percent) showed disordered proliferative endometrium, 2 (4.8 percent) showed atrophic endometrium, 1 (2.4 percent) had hyperplasia without atypia, 5 had polyps and 1 (2.4 percent) subjects showed endometritis in the report.

13 subjects showed polypoidal endometrium on Hysteroscopy which on HPE reports showed 1 (7.1 percent) had proliferative endometrium, 5 (35.7 percent) subjects had secretory endometrium, 6 (42.8 percent) subjects had disordered proliferative endometrium, 1 (7.1 percent) patients showed hyperplasia without atypia and 2 (14.2 percent) subjects showed polyp HPE reports.

9 subjects showed atrophic endometrium on Hysteroscopy which on HPE reports showed 1 (11.1 percent) had proliferative endometrium, 3 (33.3 percent) subjects had disordered proliferative endometrium, 2 (22.2 percent) subjects showed atrophic endometrium, 2 (22.2 percent) patients showed hyperplasia without atypia, 4 (44.4 percent) subjects showed polyp and 2 (22.2 percent) showed endometritis on HPE reports.

On hysteroscopy, 1 submucosal fibroid was observed (FIGO stage Submucosal- 0) which was also confirmed on HPE report.

On Hysteroscopy 4 cases of intra uterine adhesions were observed. Out of which 2 patient had proliferative endometrium and 2 had secretory endometrium on HPE reports.

Table 9: Shows Sensitivity Specificity PPV NPV

	Sensitivity	Specificity	PPV	NPV
Normal endometrium	96.67	95.83	97.50	100.00
Atrophic endometrium	100.00	98.25	85.71	100.00
Polyp	95.00	91.67	78.95	100.00
Adhesions	100.00	91.80	98.57	100.00

When the diagnostic accuracy of hysteroscopy was compared with the HPE, we found that hysteroscopy had sensitivity of 100% and negative predictive value of 100% for normal endometrium, atrophic endometrium, polyp and adhesions.

Discussion

In present study, maximum number of subjects were nulliparous i.e., 22 (34.9%) followed by parity 2 i.e., 18 (28.6%). In another study conducted by Patil S B *et al*. (2009) [7] had shown that maximum number of subjects were parity 3 (33%). The difference could be due to selection of subjects which were from perimenopausal and postmenopausal in the Patil *et al*. however in our study along with these two groups we had females from reproductive age group and infertility also.

We also observed in our study that 22 (34.9%) subjects had infertility associated with AUB. Similar finding was seen in study conducted by Patil S B *et al*. [7] where 35% subjects with AUB had infertility.

In our study we observed that majority of subjects had AUB and presented with heavy menstrual bleeding i.e., 32 (50.8%) when compared to the studies conducted by Shukla *et al*. (2014) [8]. in which heavy menstrual bleeding was seen in 45%.AUB is the leading cause of hysterectomy, a findings observed by Harjinder Singh *et al*. in 2017 in a study done at our institute [9].

In the present study, on TVS submucosal fibroid was found in three subjects, out of which only 1 subject confirmed it on hysteroscopy. TVS showed sensitivity of 40.0% and specificity of 68.5% for submucosal fibroid. In another study conducted by Marzieh Shiva *et al*. [10]. In 2017 it showed sensitivity of 50.0% and specificity of 98.0%. Specificity of TVS for submucosal fibroid has seen reduced, it is might be due to the reason that TVS was unable to differentiate fibroid/ polyp/ adenomyosis and grading as per the FIGO classification. However hysteroscopy is 100% sensitive and specific for pedunculated or FIGO 0 submucosal fibroids.

In the study conducted by Merzieh Shiva *et al*. [10] in 2017 TVS missed 13 subjects with intrauterine adhesions showing sensitivity of 30.0% and 97.4% specificity. In present study, intrauterine adhesions were seen in 4 subjects on hysteroscopy which was not detected by TVS and HPE showed different findings as multiple findings can be present in patient with adhesions. Hysteroscopy had 100% sensitivity and specificity for detection of intra uterine adhesions. So hysteroscopy could be considered as gold standard investigation of choice for diagnosing intrauterine adhesions especially during infertility workup. Findings were almost similar to study done by Jindal M, Gupta M [11], though they found no statistical significant between 2 modalities.

Conclusion

TVS is a quick, simple, least invasive, in-expensive and easily available diagnostic modality. Now a days, we are combining hysteroscopy with dilatation and curettage for further evaluation of endometrial lesions for better diagnostic accuracy of endometrial lesions where TVS is often nonspecific. Few conditions like intrauterine adhesions, polypoidal endometrium and endometrial polyps can be missed by TVS for which hysteroscopy is considered as gold standard for investigation.

Submucosal leiomyomas can also be over and under diagnosed by TVS but hysteroscopy is 100% specific for it. Many conditions like atypia and malignancy and abnormal pattern of endometrium as per the menstrual phase requires confirmation with histopathology, where both TVS and hysteroscopy can't be specific.

All three modalities TVS, hysteroscopy and histopathology have their spectrum of sensitivity and specificity for different conditions. But, for many endometrial lesions, hysteroscopy combining with TVS and D and C enhances the diagnostic accuracy by many folds.

Hence, we recommend that hysteroscopy should be routinely used for diagnostic evaluation for endometrial lesions in cases of abnormal uterine bleeding especially those with infertility.

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