

Original Research Article

Clinicopathological and hysteroscopic study of endometrium in abnormal uterine bleeding

P. Sandyarani Guruvelli¹, Bhagyalakshmi Atla^{1*}, Uma Namballi², Roohi Firdous Shaik¹, Deepika Pedireddy¹, Tharuna Shravya Gadamsetti¹

¹Department of Pathology, NRIIMS, Visakhapatnam, Andhra Pradesh, India

²Department of Obstetrics and Gynecology, NRIIMS, Visakhapatnam, Andhra Pradesh, India

Received: 25 February 2025

Revised: 17 March 2025

Accepted: 24 March 2025

*Correspondence:

Dr. Bhagyalakshmi Atla,

E-mail: dr.a.bhagyalaxmi@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Abnormal uterine bleeding (AUB) is defined as bleeding from uterus that is longer than usual (>7days), more than normal volume (>80ml/cycle) and varying in frequency. AUB is commonly seen in reproductive women and affects the quality of life. The study aims to compare the diagnostic accuracy of hysteroscopy correlated with histopathology in evaluation of pathology of endometrium in patients with AUB.

Methods: The study was a cross sectional observational study with samples of Dilatation and Curettage, endometrial biopsies, conducted at NRI Institute of Medical Sciences, Visakhapatnam, in the Department of Pathology over a period of 24 months from July 2022 to June 2024 with sample size of 135 patients.

Results: Among 135 cases, the predominant age group was perimenopausal comprising of 66 cases (48.88%). According to age wise distribution common bleeding pattern was menorrhagia in both reproductive and peri menopausal age group comprising of 39 cases and 47 cases. Post-menopausal bleeding was most common bleeding pattern in post-menopausal women comprising of 10 cases. Among the three age groups, structural causes were high comprising of 124 cases (91.85%) and non-structural causes constitute 11cases (8.14%).The commonest pattern was proliferative endometrium constituting 34.81% followed by secretory endometrium 30.37%, Hyperplasia without atypia 18.51%. Accuracy of Hysteroscopy with Histopathology was 94.44%.

Conclusions: Hysteroscopy is a safe reliable and quick procedure in the diagnosis of cases with abnormal uterine bleeding, it should not replace tissue diagnosis, which remains the gold standard.

Keywords: Abnormal uterine bleeding, Endometrial biopsy, Hysteroscopy, Histopathology, Transvaginal sonography

INTRODUCTION

Abnormal uterine bleeding (AUB) is defined as an excessive cyclical bleeding of amount>80 ml or for duration≥7 days which occurs at normal interval periods. AUB is commonly seen in women of reproductive age group and it significantly affects the quality of life.^{1,2} The most common presenting complaints are menorrhagia, metrorrhagia and polymenorrhea. International federation of gynaecology and obstetrics (FIGO) introduced PALM COEIN system of classification in 2011 to define the

causes of AUB which include-structural causes polyp, adenomyosis, leiomyoma, malignancy and hyperplasia. Non-structural causes include coagulopathy, ovulatory dysfunction, endometrial cause, iatrogenic not yet classified.³⁻⁵ In reproductive age women, complications of pregnancy including abortion are more common, while in postmenopausal women atrophy and organ pathology are common. Transvaginal sonography (TVS) serves as an economical and non-invasive method that allows for the utilization of higher frequency ultrasound waves in close proximity to the uterus without the requirement for

anaesthesia.^{6,7} It stands as the primary diagnostic tool recommended for evaluating uterine pathology in cases of abnormal uterine bleeding (AUB). Hysteroscopy allows direct visualization of the uterine cavity, it facilitates pinpointing the causes in the majority of cases. It provides accurate detection of endometrial hyperplasia and aids in the early diagnosis of endometrial carcinoma, uterine polyps and sub mucosal myomas.⁸ It is recommended to further assess the endometrium in women with abnormal bleeding when the endometrial echo is normal on TVS.⁹

Hysteroscopy facilitates endoscopic examination of the cavity of the uterus, offering the benefit of video recording for obtaining a second opinion. Studies have shown that hysteroscopy (HS) can identify lesions that TVUS may overlook. Although Transvaginal ultrasonography (TVU) is a straightforward examination enabling clear visualization of most uterine conditions, concerns have been raised regarding its accuracy. Many obstetricians now advocate for the initial use of new-generation hysteroscopy for diagnosis.¹⁰

The study aims to compare hysteroscopy and histopathological correlation in diagnosing endometrial pathology in patients with abnormal uterine bleeding.

METHODS

The present study was a cross sectional observational study with samples of Dilatation and Curettage, endometrial biopsies; conducted at NRI Institute of Medical Sciences, Sangivalasa, Visakhapatnam, in the Department of Pathology over a period of 24 months from July 2022 to June 2024 with a sample size of 135 patients. Before the commencement of the investigation, approval was obtained from the Institute's Scientific and Ethics Committee, NRIIMS.

The participants were then subjected to a general and bimanual pelvic examination and Transvaginal sonography. The following baseline investigations were performed on all patients. Blood haemoglobin estimation (in gm%), grouping, typing, BT, CT. Urine examination for albumin, sugar and microscopy. Instructions to the patient were given on the day of admission. The patients were advised to have a light dinner before 10.00 pm on the night prior to hysteroscopy. The patient were examined and re-assessed by the anaesthetist in the theatre.

After a routine examination which included vital data such as temperature, pulse, Blood pressure and cardio vascular and respiratory system examination, patient was put in lithotomy position. The part to be examined was cleaned with antiseptic solution and draping was done. In this study the hysteroscopy was performed under intra venous ketamine anesthesia and its effective period 15-20 min. The samples received in 10% buffered formalin from gynaecological department were processed by routine tissue processing. Sections of thickness 4-6 µ were cut and stained with Haematoxylin and Eosin.

Inclusion criteria

Married women between age group of 25-60 years having abnormal uterine bleeding and who had given informed written consent.

Exclusion criteria

Unmarried and pregnant women and participants who are not willing to participate. Participants presenting with vaginal, vulval or cervical causes of bleeding and woman with intrauterine contraceptive device.

Analysis was done in the form of percentages and proportions represented in the form of tables.

RESULTS

In this study, total of 135 patients presented with AUB to the Gynaecological department were clinically examined, Trans vaginal sonography and hysteroscopy was done and samples collected and received for histopathological evaluation.

According to age wise distribution, cases were categorised into 3 types: reproductive, perimenopausal and postmenopausal women (Table 1).

Out of 135 cases, (Table 1) the predominant age group was perimenopausal age group comprising 66 cases (48.88%), followed by reproductive age 52 cases (38.51%) and postmenopausal 17 cases (12.59%) (Table 1).

Participants having 1-2 children constitute majority of the cases i.e., 93 cases (68.88%) of AUB, while nulliparous women constitute only 6 cases (4.44%) of AUB cases.

Among the patients with AUB, the most common bleeding pattern was menorrhagia (71.85%), followed by metrorrhagia (9.62%) and post-menopausal bleeding (7.40%) (Table 2).

According to age wise distribution, the most common bleeding pattern was menorrhagia in both reproductive and peri menopausal age group comprising of 39 cases and 47 cases respectively. Post-menopausal bleeding was most common bleeding pattern in post-menopausal women comprising of 10 cases followed by the menorrhagia comprising 7 cases.

Structural causes in our study are polyp, adenomyosis, leiomyoma, malignancy and hyperplasia. Non-structural causes are ovulatory dysfunction, endometritis, etc (Table 3).

In the present study, among the three age groups, structural causes were high comprising of 124 cases (91.85%) and non-structural causes constitute 11 cases (8.14%) (Table 3).

Evaluation by trans vaginal sonography (n=135)

Among 135 cases, normal Trans vaginal sonography findings were seen in 96 cases (71.11%) and abnormal findings was seen among 39 patients (28.89%). Among 39 patients with abnormal TVS findings, hyperplasia constitutes 22 cases, polyps constitute 9 cases, sub mucous fibroids constitute 6 cases and atrophic endometrium constitute 2 cases respectively.



Figure 1: Trans vaginal sonography findings of endometrial polyp measuring 0.7×1 cm.



Figure 2: Hysteroscopic view of submucous fibroid.

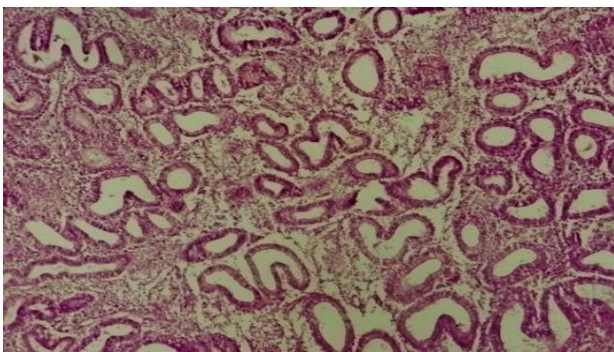


Figure 3: Endometrial hyperplasia without atypia (H&E, 10X): Photomicrograph shows back-to-back arrangement of crowded tubular glands in a relatively scant stroma.

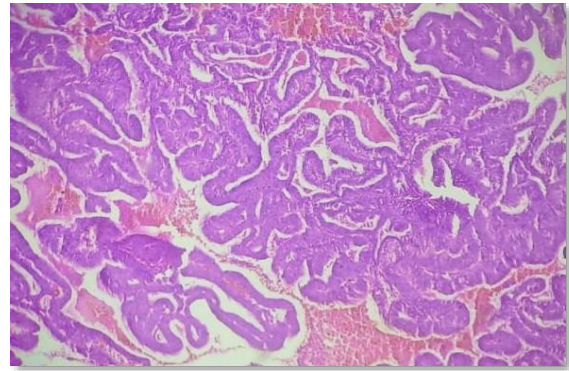


Figure 4: Photomicrograph shows endometrioid carcinoma-villoglandular pattern-photomicrograph shows neoplastic cells with moderate eosinophilic cytoplasm and moderate nuclear atypia with inconspicuous nucleoli) (H&E;40X).

Distribution of cases according to endometrial thickness (n=135)

The distribution of endometrium thickness, categorized into three distinct ranges. The majority of patients, comprising 91 individuals, exhibit endometrium thicknesses within the 5-10 mm range. Following this, there are 30 patients whose endometrium thickness falls within the 11-15 mm range. A smaller subset of the population, consisting of 14 patients, displays endometrium thicknesses in the 16-20 mm range.

Evaluation by hysteroscopy (n=135)

Abnormal hysteroscopic findings were seen in 43 patients (31.86%), while in the remaining 92 patients (68.14%), no abnormality was detected. Among the abnormal hysteroscopic findings, most common cases were hyperplasias were 30 cases (22.22%), fibroids 5 cases (3.70%), polyps 3 cases (2.22%), Atrophic endometrium 3cases (2.22%), suspicious of malignancy was 2 cases (1.51%) and these 2 cases was confirmed on histopathology as malignancies and another one case of malignancy was reported on hysteroscopy as hyperplasia. Among the causes of AUB, commonest pattern was proliferative endometrium constituting 34.81% followed by secretory endometrium 30.37%, Hypeplasia without atypia 18.51%, Disordered proliferative phase 5.92%, polyp 3.70%, Endometrial carcinoma 2.22%, atrophic endometrium 2.22%. Among 3 cases of atrophic endometrium, 2 cases are in perimenopausal age group and 1 case in post-menopausal age group (Table 4).

Validity of TVS with histopathology

Among 39 cases which were abnormal on trans vaginal sonography, 27 cases were found to have abnormality on histopathology, 12 cases were found to be normal on histopathology. Among 96 cases which have normal TVS findings, 88 cases were normal on histopathology and 8

cases found to have abnormality. Out of 135 cases, validity of TVS is estimated based on the following parameters. Sensitivity is 77.14%, specificity is 88%, positive predictive value is 69.23%, negative predictive value is 91.66% and finally accuracy was 92.18%. Among 43 cases which were abnormal on Hysteroscopy, 30 cases were found to have abnormality on histopathology, 13 cases were found to be normal on histopathology. Among 92 cases which have normal hysteroscopic findings, 87 cases

were normal on histopathology and 5 cases found to have abnormality (Table 5). Out of 135 cases, validity of hysteroscopy is estimated based on the following parameters. Sensitivity is 85.71%, specificity is 87%, positive predictive value is 69.76%, negative predictive value is 94.56% and finally the accuracy was 94.44%. The Accuracy of TVS in relation to Histopathology was 92.18% and the accuracy of hysteroscopy in relation to histopathology was 94.44%.

Table 1: Age wise distribution of patients with AUB (n=135).

Age group (in years)		Total	%
25-40	Reproductive	52	38.51
41-50	Perimenopausal	66	48.88
>50	Postmenopausal	17	12.59
Total		135	100

Table 2: Bleeding patterns in the patients with AUB (n=135).

S. No	Pattern of bleeding	Number	%
1	Menorrhagia	97	71.85
2	Metrorrhagia	13	9.62
3	Menometrorrhagia	8	5.92
4	Polymenorrhea	7	5.18
5	Post-Menopausal bleeding	10	7.40
Total		135	100

Table 3: Correlation of structural and non-structural causes with age group in cases of AUB (n=135).

Causes of AUB	25-40 Y	41-50 Y	>50 Y	Total	%
Structural causes	46	62	16	124	91.85
Non-structural causes	6	4	1	11	8.14
Total	52	66	17	135	100

Table 4: Frequency of patterns of endometrium in patients of AUB (n=135).

S. No	Histopathological diagnosis	Total	%
1	Proliferative endometrium	47	34.81
2	Secretory endometrium	41	30.37
3	Disordered proliferative phase	8	5.92
4	Hyperplasia without atypia	25	18.51
5	Hyperplasia with atypia	1	0.74
6	Endometrial carcinoma	3	2.22
7	Inadequate luteal phase	1	0.74
8	Granulomatous endometritis	1	0.74
9	Atrophic endometrium	3	2.22
10	Polyps	5	3.70
Total		135	100

Table 5: Comparison of endometrial study by trans vaginal sonography, hysteroscopy and histopathology.

	Transvaginal sonography	Hysteroscopy	HPE
Polyps	9	3	5
Fibroids	6	5	1
Hyperplasia	22	30	26
Carcinomas	-	2	3

Table 6: Validity of hysteroscopy with histopathology.

Hysteroscopy	Histopathology		
	Abnormal	Normal	
Abnormal	30 (a)	13 (b)	43 (a+b)
Normal	5 (c)	87 (d)	92 (c+d)
	35 (a+c)	100 (b+d)	135

DISCUSSION

Abnormal uterine bleeding is termed as any vaginal bleeding not fulfilling the criteria of normal menstrual bleeding. It significantly burdens healthcare resources. Abnormal uterine bleeding can stem from a multiple conditions. While at times it may reflect a normal physiological state warranting observation, it can also serve as an indirect indicator of other potentially significant underlying diseases necessitating aggressive treatments, including hysterectomy. Given its extensive array of potential diagnoses, diagnosing AUB poses a considerable challenge. Precise diagnosis is essential for effective treatment, aiming to decrease both morbidity and mortality. Various tests are available, including transvaginal scan (TVS), endometrial biopsy, saline infusion sonography and outpatient hysteroscopy, but the ideal diagnostic procedure is still debatable.

Advancements in ultrasound scanning technology have enhanced the non-invasive diagnosis of uterine conditions. Despite these improvements, certain issues, such as visualizing intrauterine adhesions or distinguishing between submucous fibroids and endometrial polyps, remain challenging.¹¹ Transvaginal sonography is regarded as a straightforward examination with reasonable accuracy, allowing clear visualization of the uterus and its pathological lesions. However, its diagnostic accuracy is reported inconsistently. Hysteroscopy offers the benefit of directly viewing the uterine cavity and endometrium, with the capability to perform biopsies on suspected abnormalities. Ultrasound has been widely used for diagnosing various gynaecological disorders and numerous studies have shown a correlation between endometrial thickness and the presence of intra cavity diseases in curettage samples

In the present study “clinicopathological and hysteroscopic study of endometrium in abnormal uterine after bleeding were performed followed by Endometrial biopsy in 135 consecutive cases of AUB and its correlation with histopathological findings were sought. The age group in this study was between 25 to 60 years and the maximum incidence was between was between 41-50 years. Panda found that maximum age incidence was between 35-45 years in range between 25-70 years.¹² In Gianninoto’s series, age range was 38-80 years and commonest incidence was between 30-45 years.¹³ Trotsenburg reported maximum age incidence between 41-50 years.¹⁴

The commonest presenting complaint in this series was menorrhagia 71.85%, followed by Metrorrhagia 9.62% and post-menopausal bleeding 7.40%. Panda’s series had 60% cases of menorrhagia followed by Polymenorrhagia and Metrorrhagia Kekelci et al, Menorrhagia 21%, PMB 13.3%, Menometrorrhagia 65.7%.^{12,15}

Among the causes of AUB, structural causes were common in the present study (91.85%) similar to the studies done by Nadia et al showed structural causes as most common (61.80%). Whereas studies done by Junudevi et al, (70.4%), Manjani et al, (53%), Doraiswami et al, (51.3%) non-structural causes as most common (61.80%).¹⁶⁻¹⁸ In the studies done by Junudevi et al, showed 34 cases (6.8%), as inadequate biopsy and diagnosis respectively.¹⁶

Endometrial pathologies constitute a significant portion of abnormal uterine bleeding occurrences, both during reproductive years and post-menopause. These pathologies encompass variations of normal endometrium as well as benign, premalignant and malignant conditions. Prior to initiating any treatment, clinicians must ensure confident diagnosis due to the repercussions of the bleeding and treatment implications. Many experts recommend endometrial sampling for all women aged ≥ 35 with AUB.

The common histopathological diagnosis are proliferative endometrium comprising 47 cases (34.81%), followed by secretory endometrium comprising 41 cases (30.37%) in the present study similar to the studies done by Themthingla et al, (PE: 17 cases, 24.3%, SE:4 cases 5.7%), Neha et al, (PE:154 cases 42%, SE:43 cases 12%) and While hyperplasia was commonest diagnosis in Manjani et al, (34%) followed by Proliferative endometrium (20.6%).^{17,19,20} Proliferative endometrium and secretory endometrium were combined into normal cyclical patterns in the studies done by Anupamasuresh et al and Doraiswami et al, constituting the commonest patterns as 26.2%, 28.4% respectively.^{18,21} Atrophic endometrium comprises of 2.22% in this study, whereas in the study Junu et al, it has shown the maximum incidence of 36.2% and in other studies like Themthingla et al (7%), Neha et al (7%), Anupamasuresh et al, (5.6%) and Doraiswami et al (2.4%) in pre and post-menopausal age group.^{16,18-21} Disordered proliferative endometrium constitute 5.18% in this study similar to the studies done by Themthingla et al, Neha et al, Manjani et al and Doraiswami et al.¹⁷⁻²⁰ Endometrial polyps among these 135 cases include 3.70%

which is similar to Themthingla et al, Neha et al, Manjani et al, Doraiswami et al, Junudevi et al and Anupamasuresh et al, constituting 21.4%, 4%, 2.6%, 4%, 11.2%, 2.2% and 8.6% respectively.¹⁶⁻²¹ Endometrial Hyperplasias (Figure 3) constitute 26 in this study and 25 (18.51%) are hyperplasias without atypia, one case (0.74%) is Hyperplasia with atypia. Whereas categorization of hyperplasias was not in the studies done by Anupamasuresh et al, Nadia et al and Doraiswami et al, constituting (26.7%), (26.8%) and (6.11%) respectively.^{18,21} In the studies of Junu et al, endometrial hyperplasia without atypia is common comprising of 16% similar to the other studies like Themthingla et al, (12.8%) and Manjani S et al, 21.3% among hyperplasias.^{16,17,19} Hyperplasias with atypia constitute 1% and 3.3% in studies done by Junudevi et al and Manjani. et al, respectively.^{16,17}

Endometrial carcinomas (Figure 4) encountered in the present study are 3 cases (2.22%) out of 135 cases. Among these 3 cases, 3 cases are Endometrioid carcinoma, villoglandular pattern (type 1 endometrial carcinoma). The other comparative studies include similar incidence of endometrial carcinoma constituting Themthingla et al 4.28%, Neha et al 1%, Manjani S 4.9% and Doraiswami et al, 4.4%. whereas the study done by Anupamasuresh et al has the high incidence of 23 case (6.4%) out of 359 cases.¹⁷⁻²¹ Endometrial carcinomas are common in peri and post-menopausal women in this study similar to all these studies.

In our study, Among 135 cases, 96 cases had normal findings on TVS. Notably, hyperplasia was detected in 22 patients, while polyps (Figure 1) were found in 9 patients, 6 cases show submucous fibroids. Two patients had atrophic endometrium, El-Khayat et al reported that the most frequent TVS finding was endometrial hyperplasia, observed in 32% of cases. Swathi et al, observed that 59% of cases showed a normal uterus on TVS, while abnormalities were noted in 41% of cases.^{22,23} This corresponds with findings by Vercellini et al, where 39% were normal and 54% abnormal and Towbin et al, where 59% were normal [52,58].^{22,23} Endometrial hyperplasia was the most common abnormality in Swathi et al's study 23 (24%), followed by endometrial polyps (8%) and atrophic endometrium (8%). Submucous fibroids were the least frequent finding (1%).

In the present study, the majority of patients, i.e., 91 individuals, exhibited endometrial thicknesses ranging from 5 to 10 mm. Following this, 31 patients had endometrial thicknesses between 11 and 15 mm, while a smaller subset of 13 patients showed thicknesses ranging from 16 to 20 mm. Transvaginal ultrasound (TVS) findings categorized by endometrium thickness ranges. Within the 5-10 mm range, TVS identifies 86 cases as normal, while detecting one case of polyp, two cases of atrophic endometrium, two case of submucous fibroid. Moving to the 11-15 mm range, TVS detects nine normal cases, 12 cases of hyperplasia, 5 cases of polyps and 4

cases of submucous fibroid. Notably, the 16-20 mm range shows 1 normal case, with hyperplasia being the most prevalent finding, observed in 10 cases, along with 3 case of polyps.

Reddy et al noted that among cases presenting with postmenopausal bleeding, four had endometrial thicknesses <4 mm in TVS, but hysteroscopy revealed atrophic endometrium.²⁴ Conversely, three cases with normal endometrial thickness in TVS showed cancerous lesions upon hysteroscopic examination. Hysteroscopy also detected a submucosal fibroid in one case suggesting its superiority in accurately diagnosing postmenopausal patients with endometrial thickness >4 mm. Similar findings were reported by Veena et al, where TVS accurately corresponded with hysteroscopic findings in six postmenopausal patients with endometrial thickness <4 mm. However, one case with 12 mm endometrial thickness was found to have hyperplastic endometrium and another case revealed an endometrial polyp detected only by hysteroscopy. El-Khayat et al found that a thick and highly reflective endometrial layer occupying the entire cavity was observed with a mean thickness of 11.2 ± 2.4 mm and endometrial polyps were found in 26% of cases with a mean thickness of 18.0 ± 5.3 mm.²²

In the present study, histopathological findings categorized by endometrium thickness. Within the 5-10 mm range, the majority of cases exhibit characteristics of the Late Proliferative Phase (41 cases), indicating active growth of endometrial tissue followed by the Secretory Phase (39 cases). Additionally, there are instances of Hyperplasia, Polyps, Disordered proliferative phase and. Atrophic Endometrium are also observed, though less frequently. Conversely, the 11-15 mm range shows 6 cases of the Proliferative Phase but Hyperplasia and Polyps constitute 4 cases each. The 16-20 mm range continues this trend, with a higher prevalence of Hyperplasia (10 cases) (Figure 3) and malignancies (3 cases) (Figure 4).

Gadge et al reported a mean endometrial thickness of 10.22 ± 3.08 mm (ranging from 2 to 16 mm) in their study.²⁵ When comparing specific conditions, they found that mean $\pm$ SD endometrial thickness was 12.15 ± 2.36 mm in cases with endometrial polyps, 10.16 ± 2.66 mm in cases with endometrial hyperplasia, 10.07 ± 2.81 mm in cases with fibroids, 11.35 ± 2.46 mm in cases with hyperplasia+polyps and 8.31 ± 3.46 mm in normal uteri. Among 39 cases which were abnormal on Trans vaginal sonography, 27 cases was found to have abnormality on histopathology, 12 cases were found to be normal on histopathology. Among 96 cases which have normal TVS findings, 88 cases was normal on histopathology and 8 cases found to have abnormality, 7 cases are endometrial hyperplasia without atypia (Figure 3) and one case is granulomatous endometritis. Gadge et al also found that out of 30 cases diagnosed as normal by TVS, 16 were confirmed as normal histopathologically, while the remaining cases showed atrophic endometrium in 6 cases, hyperplasia in 6 cases and hyperplasia with polyps in 2

cases.²⁵ Out of 30 cases of hyperplasia diagnosed by TVS, 16 were confirmed histologically as hyperplasia, 4 were suggestive of fibroids and 6 cases showed normal histology. In 18 cases of polyps diagnosed by TVS, 16 were confirmed as endometrial polyps in histopathology, while the remaining 2 cases showed hyperplasia that TVS failed to diagnose.

Hysteroscopy enables direct visualization of the endometrium, allowing for the identification of abnormalities such as polyps, fibroids, hyperplasia and cancer. Biopsies or tissue samples can also be obtained during the procedure for further evaluation. Hysteroscopy is widely regarded as the gold standard technique for both diagnosing and managing pathological conditions of the uterine cavity. Consequently, abnormal uterine bleeding (AUB) stands as the main indication for hysteroscopy in perimenopausal women. The hysteroscopic "see-and-treat" approach allows for thorough exploration of the uterine cavity, targeted biopsies of the endometrium and endocervix and immediate treatment of any identified pathologies such as polyps or myomas. It's important to note that hysteroscopy is not suitable for evaluating or treating deep myometrial pathologies such as adenomyosis or myomas with FIGO-Grade $\geq$ 3.

In this study, the most of the findings during hysteroscopy was normal results, noted in 92 patients, indicating the absence of significant abnormalities. Of the 43 patients with abnormal findings on hysteroscopy, commonest lesion seen was Endometrial hyperplasias, comprising 30 cases (22.22%) followed by submucous fibroids (3.70%) (Figure 2) and polyps (2.22%). Hysteroscopy diagnosed endometrial hyperplasia, fibroids and polyps with a specificity of 87%. In 92 cases of normal Hysteroscopic study, 5 abnormal findings were detected on histopathology Twinkle et al, observed that among 63 patients, 26 had normal hysteroscopy findings, which included proliferative and secretory endometrium.²⁶ Among the abnormal findings, 17 (26.9%) were diagnosed with endometrial hyperplasia, followed by 13 (20.6%) with endometrial polyps and 2 (3.2%) each with submucous fibroids and endometritis.

Validity of hysteroscopy with histopathology

In the present study, among 43 cases which were abnormal on Hysteroscopy, 30 cases were found to have abnormality on histopathology, 13 cases were found to be normal on histopathology. Among 92 cases which have normal hysteroscopic findings, 87 cases was normal on histopathology and 5 cases found to have abnormality. They were 2 cases of hyperplasia without atypia (Figure 3), two were polyps and 1 case is granulomatous endometritis. The accuracy of hysteroscopy in present study was 94.44% whereas the study done by Baggish et al, Barbot et al, Sheth et al, Panda et al, shows 87.5%, 84%, 82%, 92.69% respectively. A Statistical analysis of the accuracy obtained by various authors and of the present

study shows that there is no significant difference between values.

El-Khayat et al found that hysteroscopy successfully diagnosed fibroids, normal findings and polyps in 100% of cases, hyperplasia in 66.66% of cases and hyperplasia with polyps in 85.17% of cases.²² Out of 30 cases diagnosed as normal by hysteroscopy, histopathological examination (HPE) confirmed normal findings in 22 cases, atrophic endometrium in six cases and hyperplasia in two cases. Overall, hysteroscopy emerges as a pivotal diagnostic tool, particularly effective in diagnosing conditions like endometrial polyps with high accuracy. Its varying sensitivity and specificity across different conditions highlight its indispensable role in clinical practice for precise assessment of uterine pathology.

Comparasion of validities of TVS and hysteroscopy in relation to histopathology

The sensitivity of hysteroscopy (85.71%) was higher when compared to TVS (77.14%). The specificity was hysteroscopy (87 %) was little lower than the specificity of TVS (88 %). The positive predictive value of TVS and Hysteroscopy was almost same 69.76%, 69.23% respectively. The negative predictive value of Hysteroscopy (94.56%) was higher than TVS (91.66%). The accuracy of hysteroscopy (94.44%) was higher than the accuracy of TVS (92.18%). Transvaginal sonography has good sensitivity but less as compared to the Hysteroscopy. The disadvantage to TVS was it failed to identify the accurate pathology.

CONCLUSION

The findings in this study suggest that Hysteroscopy was a quite useful in diagnostic workup of abnormal uterine bleeding. Compared to Trans vaginal sonography, Hysteroscopy is a safe reliable and quick procedure in the diagnosis of cases hysteroscopy allows for a direct visualization of the endometrial cavity and offers additional opportunity of obtaining a directed biopsy if needed. with abnormal uterine bleeding with high sensitivity, specificity, positive predictive value, negative predictive value. While hysteroscopy is a useful diagnostic tool, if combined with tissue diagnosis, which remains the gold standard. Both hysteroscopy and biopsy are necessary for accurate diagnosis of AUB and for a proper treatment plan.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. HiralalKonar, DC Dutta's textbook of gynecology, 10th ed. 2022.

2. Matteson KA, Boardman LA, Munro MG, Clark MA. Abnormal uterine bleeding: a review of patient-based outcome measures. *Fertil Steril.* 2009;92(1):205-16.
3. Singh P, Singh P, Chaurasia A, Dhingra V, Misra V. Expression of ER α and PR in various morphological patterns of abnormal uterine bleeding-endometrial causes in reproductive age group. *J Clin Diagn Res.* 2016;10(8):6-9.
4. Puvitha RD, Elavasaran SM, Shylaja S. Histopathological study of endometrium in abnormal uterine bleeding an experience in a tertiary care centre of rural South India. *National J of Basic Medical Sciences.* 2017;8(1):32-8.
5. Abdullah LS, Bondagji S. Histopathological pattern of endometrial sampling performed for abnormal uterine bleeding. *Bahrain Med Bull.* 2011;33(4):1-6.
6. Dijkhuizen FP, Brolmann HA, Potters AE, Bongers MY, Heinz AP. The accuracy of transvaginal ultrasonography in the diagnosis of endometrial abnormalities. *Obstet Gynecol.* 1996;87:345-9.
7. Emanuel MH, Verdel MJ, Wamsteker K, Lamemes FB. A prospective comparison of TVS and diagnostics hysteroscopy in the evaluation of patients with abnormal uterine bleeding. *Clinical AM J Obstet Gynaecol.* 1995;172(4):547-52.
8. Taneja P, Duggal BS. Hysteroscopy: past, present and future. *Med J Armed Force India.* 2002;58:293-4.
9. de Vries LD, Dijkhuizen FP, Mol BW, Brölmann HA, Moret E, Heintz AP. Comparison of transvaginal sonography, saline infusion sonography and hysteroscopy in premenopausal women with abnormal uterine bleeding. *J Clin Ultrasound.* 2000;28(5):217-23.
10. Pop-Trajkovic-Dinic S, Ljubic A, Kopitovic V, Antic V, Stamenovic S and Pjevic AT. The role of hysteroscopy in diagnosis and treatment of postmenopausal bleeding. *Vojnosanit Pregl.* 2013;70:747-50.
11. Pantaleoni DC. On endoscopic examination of The cavity of the womb. *Med press Circ.* 1869;8:26-7.
12. Panda A, parulekar SV, gupta A. Diagnostic Hysteroscopy in abnormal uterine Bleeding and its histopathological correlation. *J Obst Gyn India.* 1999;175:74-6.
13. Gianninoto A, Morana C, Campione C. Diagnostic hysteroscopy in aub. Five years' experience. *minerva ginecol.* 2003;55(1):57-61.
14. Vantrotsenburg M, Wieser F, Naegle F. Diagnostic hysteroscopy for the investigation of abnormal uterine bleeding in Premenopausal patients. *Contrib gynecol Obstet.* 2000;20:21-6.
15. Kekelci S, Kaya M, Alan M. diagnostic value of Hysteroscopy in aub compared to pathology Report. *Iranian J of Reprod Med.* 2007;5(2):61-4.
16. Aziz N. Study Of "Histopathological pattern of endometrium in abnormal uterine bleeding in the age group 40-60 years": a study of 500 cases. *IJMSci.* 2014;1(10):67.
17. Swathi GR, Nataraja MK, Shetty SS. A comparative study of hysteroscopy and transvaginal ultrasonography in diagnosis of endometrial pathology in abnormal uterine bleeding. *Int J Reprod Contracept Obstet Gynecol.* 2020;9:1772-8.
18. Doraiswami S, Johnson T, Rao S, Rajkumar A, Vijayaraghavan J, Panicker VK. Study of endometrial pathology in abnormal uterine bleeding. *J Obstet Gynaecol India.* 2011;61(4):426-30.
19. Themthingla Zimik, Deepa Longjam, Sushila Devi L. A study of histopathological spectrum of endometrial lesions in Abnormal uterine bleeding with analysis of expression pattern of ER, PR and KI-67. *Paripex – Indian J Res.* 2020;9(6):78.
20. Khatik N, Tiwari A, Yadav K. Histopathological evaluation of endometrium and its clinical correlation in patients of abnormal uterine bleeding. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2020;9(10):4169.
21. Yv S, Jain P. Abnormal uterine bleeding: a clinicohisto pathological analysis. *International J of Reproduction, Contraception, Obstetrics and Gynecol.* 2017;3(3):656–61.
22. El-khayat W, Sleet M E, Mahdi E Y. Comparative study of transvaginal Sonography and hysteroscopy for the detection of pathological endometrial lesions in women with perimenopausal bleeding. *Middle East Fertility Society J.* 2011;16:77–82.
23. Swathi GR, Nataraja MK, Shetty SS. A comparative study of hysteroscopy and transvaginal ultrasonography in diagnosis of endometrial pathology in abnormal uterine bleeding. *Int J Reprod Contracept Obstet Gynecol.* 2020;9:1772-8.
24. Reddy S, Jayaprakash S, Venkatesh S. Comparative study of the diagnostic accuracy of transvaginal sonography vs hysteroscopy in abnormal uterine bleeding. *J South Asian Feder Menopause Soc.* 2020;8(1):30–3.
25. Gadge A, Acharya N, Shukla S, Phatak S. Comparative Study of Transvaginal Sonography and Hysteroscopy for the Detection of Endometrial Lesions in Women with Abnormal Uterine Bleeding in Perimenopausal Age Group. *J South Asian Feder Obst Gynae.* 2018;10(3):155-60.
26. Twinkle, Khan A, Nigar A, Singh K, Gupta B, Khan MFF. An analytical study of hysteroscopic evaluation in patients with abnormal uterine bleeding and its correlation with histopathology. *Indian J Obstet Gynecol Res.* 2023;10(4):426-32.

Cite this article as: Guruvelli PS, Atla B, Namballi U, Shaik RF, Peddireddy D, Gadamsetti TS. Clinicopathological and hysteroscopic study of endometrium in abnormal uterine bleeding *Int J Res Med Sci* 2025;13:1594-601.