

Role of Office Hysteroscopy versus Transvaginal Sonography and Histopathology for Evaluation of Abnormal Uterine Bleeding

Prami Atta¹, Kiran Trivedi², Varsha Oraon³¹Senior Resident, Senior Resident, Department of Obstetrics and Gynaecology, Shaheed Nirmal Mahto Medical College, Dhanbad, Jharkhand, India²Associate Professor, Department of Obstetrics and Gynaecology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India³Senior Resident, Department of Obstetrics and Gynaecology, Medini Rai Medical College and Hospital, Palamu, Jharkhand, India

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Corresponding Author: Prami Atta

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Abstract:

Abnormal bleeding in the uterus is the problem faced by one-third women who receive treatment from gynaecologists. Several prevalent bleeding in the uterus could be because of endometrial tumours, hypertrophy of the endometrium, submucous fibroid tumour and anovulation. The frequency of hysterectomy can be reduced with the precise detection of the underlying cause of abnormal uterine bleeding (AUB). The aim of this study was to assess the aetiology of irregular bleeding from the uterus by the utilisation of office hysteroscopy and transvaginal sonography while comparing the results to the pathological diagnosis, which is considered the benchmark.

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Introduction

Abnormal bleeding in the uterus is a prevalent condition in the woman of all ages. Abnormal uterine bleeding refers to the appearance of blood abnormally from the uterus that affects a woman's overall health. A study conducted on women referred to gynaecology clinics revealed that 33% of the participants experienced abnormal uterine bleeding (AUB). [1,2] Notably, this percentage increased to 69% among women who were in the menopausal stages. This study is conducted in women of a particular population to evaluate which intervention could be better to assess bleeding in the uterus. The International Federation of Gynaecology and Obstetrics (FIGO) and the American College of Obstetricians and Gynaecologists (ACOG) jointly proposed the adoption of a standardised nomenclature known as the PALM-COEIN acronym for the purpose of describing aberrant menstrual patterns. The acronym PALM is utilised to denote the potential aetiologies of structural or organic origins, encompassing P for polyp, A for adenomyosis, L for leiomyoma, and M for malignancy and hypertrophy. [3,4] The acronym COEIN is utilised to categorise non-structural factors contributing to certain conditions. These factors encompass C, which represents coagulopathy, O, which signifies ovulatory problems, E, which denotes hyperplasia of the endometrium, I, which stands for iatrogenic reasons, and N,

which encompasses non-classified factors. [5]

Abnormal uterine bleeding is a frequently encountered clinical issue that presents with a wide range of underlying reasons. A comprehensive understanding of the physiological processes related to menstruation, coupled with a systematic approach to identifying potential causes, is essential for effectively assessing and addressing this issue. Typical menstrual cycles exhibit 28 days with a standard deviation of +/- 7 days, a duration of 4 days with a standard deviation of +/- 2 days, and a blood loss of 40 ml with a standard deviation of +/- 20 ml. [6]

While there are distinct patterns associated with each category, the association between irregular bleeding patterns and their underlying causes lacks consistency. According to a study, abnormal bleeding in the uterus is responsible for around 66% of all hysterectomies. In recent decades, many techniques such as transvaginal sonography and hysteroscopy have been used to evaluate the uterine cavity. Each method possesses its own set of advantages and limitations. [7,8]

Hysteroscopy has been recognised as a valuable diagnostic method that demonstrates a favourable safety profile, exhibiting a minimal occurrence of clinically important sequelae. Hysteroscopic visualisation demonstrates a high level of diagnostic

accuracy for endometrial cancer, whereas its effectiveness in diagnosing other endometrial illnesses is relatively moderate. The technique of hysteroscopy is reliant on the skill and expertise of the operator, which might affect its sensitivity and make it less ideal compared to histological testing. The utilisation of office hysteroscopy offers the distinct benefit of accurate visibility of the uterus and its innermost layer. However, it is important to note that this procedure does not provide information or assessment of myometrial pathology. Hysteroscopy is an invasive and costly process and therefore it cannot be easily accessed for all the patients. For individuals with abnormal uterine bleeding (AUB). Therefore, the existing methods now in use have significant limitations. [9]

Grigoris F Grimbizis in 2010 conducted a comparative study in 105 consecutive women to assess the efficiency of hysteroscopy and transvaginal sonography in the assessment of the endometrium. Hysteroscopy had superior efficiency over the transvaginal sonography, the diagnostic process was also favourable [10].

In 2017, Audimulapu and Sudeepti undertook a comparison research study with a cohort of 50 women with abnormal bleeding in the uterus. This study aims to assess and compare the evaluating efficiency of TVS and hysteroscopy in identifying uterine anomalies associated with AUB. The researchers aimed to establish a correlation between the findings from both diagnostic procedures and the results obtained from histological analysis. Hysteroscopy is considered the optimal choice for evaluating abnormal uterine bleeding (AUB) due to its superior diagnostic capabilities in comparison to transvaginal ultrasound (TVS). Furthermore, it facilitates the direct observation of the cavity and enables the collection of samples for subsequent histological evaluation. The user did not provide any text to rewrite. There is a lack of research examining the comparative outcomes of transvaginal ultrasound (TVS) and hysteroscopy as diagnostic modalities for cases of abnormal uterine bleeding (AUB) in low-resource regions such as Jharkhand.

So, this study was done to evaluate the assessment efficiency of transvaginal ultrasonography and hysteroscopy in determining the cause of abnormal

bleeding in the uterus and compare it with the results with histological results and to determine the feasibility of office hysteroscopy as a primary procedure in evaluation in AUB.

Methods:

Type of study: Prospective, comparative clinical study

Study duration: 18 months

Sample size: 90 consecutive cases of AUB coming to Department of Obstetrics & Gynaecology, RIMS, Ranchi, who were willing to participate in study. (Sample size decreased from 126 to 90 due to COVID Pandemic)

Sampling Procedure: Consecutive, purposive sampling.

Inclusion Criteria

1. Women with more than 20 years of age with abnormal bleeding (heavy menstrual bleeding, inter menstrual bleeding, continuous bleeding, postmenopausal bleeding) irrespective of parity.
2. Women who consented for the study.

Exclusion Criteria

1. Pregnant women with AUB.
2. Patient with active pelvic infection.
3. Patients with causes of bleeding like erosion, polyp.
4. Patients on any hormonal replacement therapy or on any anticoagulants.
5. Patient with AUB who required emergency treatment.
6. Patient with subserosal and intramural fibroid (> Grade 2) diagnosed in TVS.

Results:

Age distribution of patients under study is given in the table 1. Maximum number of 36 (40%) patients in present study were in the age group of 41-50 years, 32 (35.6%) patients were in the age group of 31 – 40, 17 (18.9%) patients were of >50 years and only 5 (5.6%) were less than 30 years [Table 1].

Table 1: Age wise distribution

Age (Years)	Frequency	Percentage (%)
< 30	5	5.6
31 - 40	32	35.6
41 - 50	36	40.0
>50	17	18.9
Mean age \pm SD (Min.-Max.)	43.46 \pm 8.39 (22 - 66) years	

Table 2: TVS findings in patients of AUB (n=90)

Finding TVS	Frequency	Percentage (%)
Endometrial hyperplasia	25	27.8%
Endometrial carcinoma	4	4.4%
Atrophic endometrium/ Thinned endometrium	5	5.6%
Endometrial polyp	16	17.8%
Submucosal fibroid	13	14.4%
Adenomyosis	10	11.1%
CU-T in situ	4	4.4%
Intramural Leiomyoma	4	4.4%
Ashermann syndrome	2	2.2%
Retained product of conception	2	2.2%
Normal	5	5.6%

Endometrial hyperplasia was diagnosed in 21 (23.3%) cases, endometrial polyp were diagnosed in 17 (18.9%) cases, endometrial carcinoma were diagnosed in 10 (11.11%) cases, sub-mucosal fibroid were diagnosed in 12 (15.613.3%) patients, and atrophic endometrium were noted in 6 (6.6%). Ashermann syndrome and CU-T were diagnosed in 4 (4.4%) patients each. Adenomyosis, intramural leiomyoma and retained product of conception were diagnosed in 2 (2.2%) cases each. Normal findings detected by hysteroscopy were 10 (11.1%) cases. Endometrial hyperplasia 21 (23.33%), endometrial polyp 17 (18.9%), submucosal fibroid 12 (13.33%), adenomyosis 10 (11.1%), endometrial carcinoma 10 (11.1%), atrophic endometrium 6 (6.6%), retained product of conceptus 2, intramural leiomyoma and epithelioid cell granulomas present 4 (4.4%) each. Only 4 (4.4%) cases were found to be normal study.

Discussion:

Abnormal bleeding in the uterus is a prevalent gynaecological issue encountered by healthcare professionals, constituting roughly 15-20% of visits to medical offices and 26% of operative procedures of the uterus. The aforementioned proportion increases to 69% when accounting for individuals within the perimenopausal and postmenopausal age cohorts. The precise identification of the aetiology of abnormal bleeding in the uterus (AUB) is of utmost importance. An optimal diagnostic test should possess characteristics such as minimal invasiveness or non-invasiveness, simplicity in execution, high acceptability among patients, affordability, and a high degree of sensitivity and specificity. [11]

Ninety women diagnosed with abnormal uterine bleeding (AUB) were selected for this clinical trial using successive purposive sampling. A comprehensive historical account was acquired from each patient. They were systemically examined and pelvis was thoroughly examined. The appropriate laboratory tests were conducted in accordance with the requirements. In order to assess the diagnostic accuracy of TVS and Hysteroscopy, as well as to identify various causes of Abnormal bleeding in the uterus (AUB), both modalities were employed in all cases

of AUB. Histopathological testing was conducted on samples from patients who underwent hysteroscopy sessions and hysterectomy procedures due to abnormal uterine bleeding (AUB). The final diagnosis refers to the diagnosis that was determined subsequent to the receipt of the histopathology results. It functioned as the benchmark for diagnostic purposes. [12] The present study observed a peak incidence rate of 40% among individuals aged 41 to 50 years. The average age of the participants was 43.46 years, with a standard deviation of ± 8.39 .

This observation is similar to the study conducted by Panda where maximum incidence was between 35 to 45 years. [13] In Gianninoto series commonest incidence was between 30 to 45 years. Trotsenburg reported maximum age incidence between 41 to 50 years. [14]

Majority of the women in this study were multipara (91.1%), which is similar to the study conducted by Bhosle, et al (2010) where maximum incidence was with multipara (60%). [15]

83 out of 90 women (92.2%) belonged to low socioeconomic status and 81 out of 90 (90%) were from rural background. Majority of patients in this study group, 14 out of 90 (15.6%) had hypertension and diabetes, which is consistent with the study conducted by Sabre, Alexander, et al where 66.6% had hypertension and 28.1% had diabetes, which showed higher number of incidences with endometrial carcinoma.[16] In this study, the maximum number of patients was between 41 to 50 years (40%). Mean age was 43.46 years with standard deviation of ± 8.39 . A study by Kekelei had one third women with age range of 40 to 50. Most of the patients in this study were multipara (91.1%), which is similar to the study conducted by Bhosle, et al (2010) where maximum incidence was with multipara (60%). [15]

In this study majority complaints were of menorrhagismenorrhagia 28.9% followed by post-menopausal bleeding 20% and polymenorrhagia 16.7%, which is similar to the study conducted by Panda's had 60% cases of had heavy bleeding followed by metrorrhagia and polymenorrhagia. [16]

According to our study, uterine pathology on TVS were found in 85 cases (94.4%), while in the remaining 5 cases (5.6%), no problems were detected. Of the 85 cases with uterine pathology on TVS, the most common lesion seen was endometrial hypertrophy (25 cases- 27.8%), followed by endometrial tumor (16 cases – 17.8%), submucosal fibroid (13 cases - 14.4%) and adenomyosis (10 cases –11.1%). We have results in accordance to the study conducted by Soguktas, et al (2012) which shows endometrial polyp is the commonest lesion detected by TVS. [17-18] Study conducted by Waleed el khayat, et al conducted a study on 50 women with perimenopausal bleeding (2011), endometrial hyperplasia was found in 50% of the patients followed by endometrial polyp in 25% of the cases. [19] Bhosle et al (2010) conducted a study on 112 perimenopausal women and they concluded that fibroids (53.3%) were the most common cause of AUB.[15] Study conducted by Ozdemir, et al (2010) conducted study on 144 perimenopausal women, endometrial hypertrophy was reported in 11.8%, endometrial tumor in 4.2%, and 5.5% endometrial carcinoma.[17].

In this study, uterine pathologies were detected in hysteroscopy in 80 patients (88.9%), while 10 patients (11.1%), had no abnormality. From the 78 cases with uterine pathology on hysteroscopy endometrial hypertrophy was the most common (21 cases- 23.3%), followed by endometrial tumor (17 cases- 18.9%), submucosal fibroid (12 cases – 13.3%) and endometrial carcinoma (10 cases – 11.1%). This study is similar to the study conducted by Panda and reported hypertrophy in 28.3% [13]. Trotsenburg observed myomas and polyps in 14%. [14] Acharya, et al (2009) found hyperplasia in 18%, atrophy in endometrium in 8%, endometrial tumor in 9%, submucous myoma in 11%, endometrial carcinoma in 3%. [20]. Most common causes detected by HPE was endometrial hypertrophy in 23.33% cases, followed by endometrial tumor in 18.9% cases, submucosal fibroid in 13.33% cases, and both endometrial carcinoma and adenomyosis were in 11.1% cases each. [21,22]

In their study, Fadele et al. conducted a comparison between transvaginal ultrasound (TVS) and hysteroscopy as diagnostic methods for submucous myomas. The researchers reached the conclusion that the process of tracing uterine tumours was shown to be more accurate when using transvaginal ultrasound (TVS) compared to hysteroscopy. However, it should be noted that TVS is unable to differentiate between an endometrium tumour and a submucous myoma. [23]

Hysteroscopy offers a distinct benefit in the diagnosis of carcinoma of the endometrium by enabling a focused biopsy in cases of localised lesions, hence minimising the occurrence of false negative results. Furthermore, it allows for accurate categorization of the scope and magnitude of hypertrophy. The visual

characteristics of endometrial cancer during hysteroscopy can exhibit a range of presentations, including flat sessile or pedunculated forms, as well as irregular, polypoidal development patterns. The provided text consists of two numerical values, specifically 22 and 23. The study conducted by Clark focused on evaluating the precision of hysteroscopy as a diagnostic tool for endometrial cancer and hypertrophy. The researchers reached the conclusion that the diagnostic success rate of hysteroscopy is good when it comes to detecting endometrial carcinoma but only moderate for identifying other endometrial disorders. In their study, Gull B assessed the efficacy of transvaginal ultrasound (TVS) in identifying endometrial cancer with an endometrial thickness of 4mm. The results indicated were sensitive and specific with 10% and 60% respectively, with a positive predictive value (PPV) of 25% and a negative predictive value (NPV) of 100%. [24,25]

The occurrence of vaginal bleeding following a period of amenorrhea lasting six months, which is assumed to be associated with menopause, should be regarded as atypical and necessitates further examination. The procedure of blind dilatation and curettage is found to sample just 60% of the endometrium. The majority of focal lesions that are readily identifiable during hysteroscopy are not detected during blind dilation and curettage (D&C) procedures. The meta-analysis conducted by Smith-Bindmann et al. involved the synthesis of published data from several studies on transvaginal ultrasound (TVS) conducted on a sample of 5892 postmenopausal women. The analysis revealed that there were 13% for endometrial cancer and 40% for hypertrophy or tumor. The optimal trade-off between sensitivity and specificity relies on the selection of an appropriate endometrial thickness threshold for defining abnormality. When a 3mm cutoff was employed, the sensitivity and specificity of the test were determined to be 98% and 38% respectively. However, when a 5mm cutoff was utilised, the corresponding test characteristics were found to be 92% and 82%. In their study, Tinelli K et al reached the conclusion that hysteroscopy is a diagnostic tool of greater accuracy for detecting endometrial diseases compared to transvaginal ultrasound (TVS). They found that hysteroscopy exhibits improved specificity and hence recommend its consideration for all patients experiencing postmenopausal bleeding and possessing an endometrial thickness over 4mm. [26,27]

TVS was efficient in the examination of the all the layers of the uterus in 95% of the patients. Hysteroscopy can examine the reason for the failure of the intrauterine devices by observing it on a radiograph. [28]

Symonds (year) conducted comparative research examining the use of transvaginal sonography (TVS) and hysteroscopy [29, 30]. The researcher reached the conclusion that hysteroscopy is characterised by

its efficiency, convenience, and enhanced accuracy. Additionally, the possibility of performing a biopsy concurrently further supports the preference for hysteroscopy over transvaginal ultrasound.

Conclusion:

The current study compared the diagnostic accuracy of TVS and hysteroscopy versus histopathological finding (gold standard) in the detection of various uterine pathologies, in cases of AUB. It can be concluded from the present study that hysteroscopy offers definite advantage over TVS in diagnosis of endometrial carcinoma, endometrial hyperplasia, endometrial polyps, submucous fibroids, with higher sensitivity and overall higher diagnostic accuracy than TVS. The diagnostic accuracy of TVS is more in cases of adenomyosis and intramural fibroids as compared to hysteroscopy. TVS being a non-invasive procedure helps in making a basic diagnosis and then confirming it by hysteroscopy and further biopsy. Office hysteroscopy can also be used as “see and treat” procedure for endometrial polyp in a single sitting. In cases of misplaced IUCD, hysteroscopy can again serve as single one time procedure for removal of IUCD under direct visual control.

Hysteroscopy is a renowned and straightforward procedure that has minimal risk, enabling a thorough examination of the uterine cavity with visual guidance. Hysteroscopy offers the potential for expedited diagnosis and efficacious treatment in those experiencing abnormal uterine bleeding. Hysteroscopy and transvaginal ultrasound (TVS) are mutually beneficial in the diagnostic and therapeutic approaches for patients with bleeding in the uterus. Therefore, it can be inferred that hysteroscopy and transvaginal ultrasound (TVS) are essential tools in the repertoire of gynaecologists for the purpose of diagnosing anomalous bleeding in the uterus.

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