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Original Research Article

A cross sectional study determine the role of hysteroscopy in abnormal uterine bleeding and its histopathological correlation

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Abstract

Background: Menstrual dysfunction is a prevalent concern for women globally, manifesting as discomfort and disruption to healthy lifestyles. Millions of women in both developed and developing countries experience various degrees of menstrual irregularities, which can lead to physical and emotional distress, ultimately affecting their quality of life and reproductive health. Accurate diagnosis and effective treatment of abnormal uterine bleeding (AUB) are essential for restoring normalcy and improving health outcomes.

Aim: This study aims to evaluate the accuracy of hysteroscopy in the assessment of AUB and to correlate hysteroscopic findings with subsequent histopathological analyses.

Methodology: A cross-sectional study was conducted in the Department of Obstetrics and Gynaecology Nalanda Medical College and Hospital, Patna, Bihar, India The study included 60 female patients aged 18 years and older, presenting with documented abnormal uterine bleeding. Patients with identifiable pelvic pathologies and those on hormonal treatments were excluded. Hysteroscopy was performed to directly visualize the uterine cavity, followed by dilation and curettage (D&C) for histopathological examination of the endometrial samples. Data on demographics, clinical history, hysteroscopic findings, and histopathological results were collected and analyzed.

Results: The study revealed that 60% of patients had a normal endometrium during hysteroscopy, while endometrial polyps (18.33%) and hyperplasia (13.33%) were the most common abnormalities identified. Most patients (51.67%) were in the 40-49 years age group, with menorrhagia being the most frequently reported condition (50 patients). Notably, 56.67% of patients reported symptoms lasting between 6 months to 1 year.

Conclusion: Hysteroscopy proved to be a valuable diagnostic tool in assessing AUB, providing enhanced accuracy compared to traditional methods. The findings indicate a significant prevalence of endometrial abnormalities among women with AUB, underscoring the necessity of hysteroscopy for effective management. This study supports the integration of hysteroscopy into routine gynecological practice for improved diagnosis and treatment of menstrual dysfunction.

Keywords: Abnormal uterine bleeding, Endometrial abnormalities, Hysteroscopy, Hyperplasia Menstrual dysfunction

Introduction

Menstrual dysfunction is a major problem in women's lives around the world, causing them inconvenience, discomfort, and an interruption to their otherwise healthy lifestyles [1]. This condition affects millions of women from both developed and developing countries to different extents. This problem can cause physical and psychological distress to a woman and affect her quality of life, reproductive health, and overall well-being. In the wake of such challenges, an accurate diagnosis and effective treatment of the underlying causes of AUBs are considered to restore normalcy and enhance the health outcome [2]. The history of diagnostic evaluation of menstrual dysfunction starts with D&C. This procedure carries out the surgical scraping of the uterine lining with a view to attain tissue samples for examination; the procedure is still highly limited in its approach. However, research has proven that D&C identifies the underlying cause of abnormal bleeding in less than 50% of cases. This deficiency makes a case for better diagnostic methods that can give more detailed information about the uterine pathologies contributing to AUB. This led gynecologists to seek alternative diagnostic methods that offer more accurate information and provide better patient care [3].

Hysteroscopy has become a crucial diagnostic tool in gynecology, enabling direct visualization of the uterine cavity. Hysteroscopy is performed when a

hysteroscope—a thin instrument with light—must be placed through the cervix to reach the uterine interior. This allows the interior lining of the uterus to be seen directly, and even abnormalities in the form of polyps, fibroids, and endometrial hyperplasia can be detected. Through this view of the uterine cavity, the gynecologist is well able to make better diagnoses and treatment decisions. Hysteroscopy thus dramatically increases diagnostic accuracy in the diagnosis of AUB. Targeted treatment thus gains the most important advantages, addressing most of the shortcomings of traditional methods. Unlike blind curettage, which would only depend on guesswork, hysteroscopy can visualize the area of concern directly. This allows them to intervene immediately, like removal of polyps or biopsy of suspicious lesions, in the same procedure. This is the reason that more and more patients nowadays opt for hysteroscopy management of AUB since it not only provides diagnostic clear-cut results but also has been proven to reduce secondary surgery interventions. It is rightly known as a "camera in the uterus" as proper assessment and management becomes feasible [4,5].

Hysteroscopy is also an indispensable aid in the preoperative evaluation of elective surgeries. Accurate identification and characterization of uterine abnormalities will allow gynecologists to develop more tailored surgical approaches that are more in line with the patient's needs. Targeted planning has the added advantage of surgical outcomes as interventions may be modified in accordance with findings observed in the course of the hysteroscopic examination. In consequence, inclusion of hysteroscopy in the day-to-day practice of gynecology represents an important advance in the treatment of menstrual dysfunction and other diseases of the uterus [6,7].

This study aims to evaluate the accuracy of hysteroscopy in the assessment of abnormal uterine bleeding and to correlate the findings obtained during hysteroscopy with subsequent histopathological analyses. By examining the relationship between hysteroscopic observations and tissue samples, the study seeks to enhance understanding of the diagnostic reliability of hysteroscopy. Such an analysis is vital for confirming the efficacy of hysteroscopy as a superior diagnostic tool and establishing its role in guiding clinical management.

Methodology

Study Design

This study utilized a cross-sectional design to evaluate the correlation between hysteroscopic findings and histopathological results in patients presenting with abnormal uterine bleeding. The objective was to establish a comprehensive understanding of the underlying causes of abnormal uterine bleeding through direct visualization and histological examination.

Study Area

The research was conducted in the Department of Obstetrics and Gynaecology Nalanda Medical College and Hospital, Patna, Bihar, India for one year. This setting provided a conducive environment for the assessment of patients presenting with gynecological issues, given the department's resources and expertise.

Sample size

The study includes 60 women.

Sample Selection Criteria

A total of one hundred patients were selected for the study based on the following inclusion and exclusion criteria:

Inclusion Criteria

- Female patients aged 18 years and above.
- Patients admitted with a documented history of abnormal uterine bleeding.

Exclusion Criteria

- Presence of demonstrable pelvic pathology (e.g., fibroids, cancer of the cervix, vagina, or endometrium) based on clinical examination.
- Patients on hormonal treatments, such as tamoxifen.
- Individuals experiencing active profuse uterine bleeding.
- History of recent intrauterine perforation.

Study Variables

- **Independent variables**

  In this study, the independent variables included patient demographics and clinical characteristics that may influence the occurrence and presentation of abnormal uterine bleeding. These independent variables comprised patient age, parity, clinical history, and presenting symptoms. Patient age is a critical factor, as it can correlate with the likelihood of various gynecological conditions; for instance, younger patients may experience different etiologies of abnormal bleeding compared to older patients. Parity, or the number of pregnancies a woman has carried to a viable gestational age, is also considered important, as it can affect hormonal balance and uterine health. Clinical history encompasses a range of factors, including previous gynecological issues, surgeries, and underlying medical conditions that may predispose a patient to abnormal uterine bleeding. Presenting symptoms, such as the duration, frequency, and

volume of bleeding, provide essential insights into the severity and potential causes of the condition.

- **Dependent variables**

  The dependent variables in this study were the findings observed during hysteroscopy and the subsequent histopathological results obtained from endometrial samples. Hysteroscopic findings included any endometrial abnormalities, such as hyperplasia, polyp formation, or intrauterine lesions, which can directly contribute to abnormal bleeding patterns. These visual assessments are critical for guiding diagnosis and treatment. Histopathological results further elucidate the nature of the endometrial tissue, identifying specific conditions such as various types of endometrial hyperplasia or malignancy. By analyzing these dependent variables, the study aimed to establish a correlation between the visual findings during hysteroscopy and the underlying histopathological conditions, thereby enhancing the understanding of abnormal uterine bleeding and its management.

Data Collection Method

Data were collected using a predesigned proforma that included sections for demographic information, clinical history, findings from hysteroscopic examinations, and results from histopathological analyses. Detailed history-taking and clinical assessments were performed on each patient upon admission to gather comprehensive information relevant to their conditions.

Procedure

A detailed history and clinical examination were used to assess each patient on admission to the hospital. The process was symptom-focused, including the duration, frequency, and characteristics of episodes of abnormal uterine bleeding. History-taking included any previous gynecological problems, surgeries, or medical conditions that could impact the patient's status. By noting these facts minutely, practitioners could extract such fundamental knowledge related to the causes that would lead to such pathological haemorrhage and thereby formulate further investigations based on their findings. After taking the preliminary impression, appropriate lab tests were done, keeping the aim in view to negating any possible latent disease leading to such hemorrhage. Full blood counts, coagulation profiles, and thyroid function testing were performed to rule out other medical diseases that could cause this.

It helped the doctor decide how to treat this woman, excluding some of the causes of her abnormal uterine bleeding. Patients were then scheduled for hysteroscopy following preliminary investigations. It is recommended that this be done during the post-menstrual phase, which will favour a better view of the uterine cavity as well as minimize confounding variables brought about by menstrual flow. Extra measures had been taken to ensure that those patients experiencing pathological cyclic menstruation periods or even regular flow of blood within the vagina were presented with the environment for viewing as comprehensive and effectively possible with this hysteroscopic examination; this was to be by passing a hysteroscope in the uterine passageway with a visual inspection directly of the interior cavity of the endometrium to identify any present abnormalities within.

All patients had D&C to acquire endometrial samples for histological analysis after the hysteroscopic examination. The procedure involves carefully scraping off the uterine lining to obtain tissue samples, which are then submitted to a pathology lab for histological analysis. To identify the origin of irregular uterine bleeding, a histological investigation was performed to look for abnormalities in the endometrial tissue, which might include inflammation, hyperplasia, or cancer. The outcomes of the two hysteroscopic exams were recorded and compared to the findings of the histological study. To identify patterns and connections between ocular evaluations and histological findings, this data-gathering procedure allowed the findings from aberrant uterine bleeding to be fully investigated. The goal of the research is to better understand the circumstances associated with abnormal uterine bleeding in clinical settings and to develop suitable therapeutic strategies for afflicted patients by carefully and methodically correlating these data sets.

Statistical Analysis

The study was analyzed by using the SPSS v.27.0 program, which is a statistical tool designed for social sciences. A significant criterion of P=0.05 was used. Numerical and percentage values were used to describe quantitative data. The quantitative data was characterized using statistical measures such as range, mean, standard deviation (SD), and median. The $\chi 2$-test was used to evaluate the comparability of several groups based on categorical data.

Results

The table illustrates the age distribution of patients, highlighting that the majority (51.67%) fall within the 40-49 years age group, indicating this group is the most represented in the study. The 30-39 years group follows with 33.33%, while the younger 20-29 years group comprises only 6.67% of the total patients. The 50-60 years group accounts for 8.33%, which shows a relatively low representation

compared to the other age groups. Overall, this distribution suggests that the patient population is predominantly middle-aged, with a significant drop in the younger demographic.

Table 1: Distribution of Patients According to Age (N = 60)

Age Group	No. of Patients	Percentage
20-29	4	6.67
30-39	20	33.33
40-49	31	51.67
50-60	5	8.33

The table provides a breakdown of clinical presentations among patients based on age groups. Menorrhagia is the most common condition, affecting 50 patients, with the highest prevalence in the 40-49 years age group (27 patients), followed by 18 patients in the 30-39 years group. In the younger cohort (20-29 years), there are 3 cases. Polymenorrhea accounts for 9 patients, predominantly seen in the 40-49 years group (4 patients), with a smaller representation in the other age groups. Post-menopausal bleeding is less frequent, affecting a total of 6 patients, primarily in the 50-60 years group (3 patients). Overall, the data indicate that menorrhagia is the leading clinical condition among the patient population, particularly in middle-aged individuals, while polymenorrhea and post-menopausal bleeding are less common.

Table 2: Distribution of Patients According to Clinical Presentation and Age (N = 60)

Condition	20-29 yrs	30-39 yrs	40-49 yrs	50-60 yrs	Total
Menorrhagia	3	18	27	2	50
Polymenorrhea	1	3	4	1	9
Post-menopausal bleeding	0	1	2	3	6
Total	**4**	**22**	**33**	**6**	**60**

The table categorizes patients based on the duration of their symptoms. A significant portion of patients (56.67%) report symptoms lasting between 6 months to 1 year, indicating that this timeframe is the most common duration for the population studied. Additionally, 30% of patients experience symptoms for less than 6 months, while 13.33% report symptoms persist for more than 1 year. This distribution suggests that the majority of patients seek medical attention relatively early in the course of their symptoms, with a noteworthy prevalence of symptoms lasting up to one year. The lower percentage of patients with symptoms extending beyond a year may indicate either effective management or a more acute nature of the conditions being treated.

Table 3: Distribution of Patients According to Duration of Symptoms (N = 60)

Duration of Symptoms	No. of Patients (N = 60)	Percentage
< 6 months	18	30%
6 Months - 1 year	34	56.67%
> 1 year	8	13.33%

The table presents the findings from hysteroscopy conducted on the patient population. Most patients (60%) were found to have a normal endometrium, suggesting that a significant portion of the

population does not exhibit any abnormal findings during the procedure. Endometrial polyps are the next most common finding, affecting 18.33% of patients, followed by endometrial hyperplasia at 13.33%. Submucous myoma was identified in 6.67% of patients, while only 1.67% exhibited endometrial atrophy. These results indicate that while most patients have normal endometrial findings, there is a notable prevalence of conditions such as endometrial polyps and hyperplasia, which may require further management. The low incidence of submucous myoma and endometrial atrophy reflects that these conditions are less common in the studied cohort.

Table 4: Distribution of Patients According to Findings at Hysteroscopy (N = 60)

Hysteroscopic Findings	No. of Patients	Percentage
Normal endometrium	36	60%
Endometrial hyperplasia	8	13.33%
Endometrial polyps	11	18.33%
Submucous myoma	4	6.67%
Endometrial atrophy	1	1.67%

The table outlines the histopathological findings from endometrial samples taken from the patient cohort. A significant majority of patients (75%) were found to have normal endometrial tissue, indicating that a large portion of the population does not present with any histopathological abnormalities. Endometrial hyperplasia is the second most common finding, present in 16.67% of patients, with the majority of these cases classified as cystic hyperplasia (10%), while simple hyperplasia accounts for 3.33%, and atypical and adenomatous forms each represent 1.67%. Additionally, endometrial polyps were found in 6.67% of patients, indicating their relatively low prevalence. Submucous myoma and atrophic endometrium were observed in only 1.67% of patients each. Overall, these findings suggest that while normal endometrial histology is prevalent in this patient population, there are still notable cases of endometrial hyperplasia, particularly cystic hyperplasia, warranting further clinical consideration. The low incidence of submucous myoma and atrophic endometrium indicates these conditions are less common in this group.

Table 5: Distribution of Patients According to Findings at Endometrial Histopathology (N = 60)

Histopathology Findings	No. of Patients (N = 60)	Percentage
Normal	45	75%
Endometrial Hyperplasia	10	16.67%
1. Cystic	6	10%
2. Simple	2	3.33%
3. Atypical	1	1.67%
4. Adenomatous	1	1.67%
Endometrial Polyps	4	6.67%
Submucous Myoma	1	1.67%
Atrophic Endometrium	1	1.67%

The table summarizes the postoperative complications experienced by patients following their procedures. A total of 20% of patients reported vomiting, indicating it is the most common

complication observed in this cohort. In contrast, bleeding per vaginum (PV) occurred in only 1.67% of patients, representing a rare complication in the studied group. These findings suggest that while postoperative vomiting is relatively common, the occurrence of significant bleeding is infrequent, indicating a generally low complication rate associated with the procedures performed. The data highlights the importance of monitoring patients for common postoperative symptoms while also suggesting that severe complications, such as excessive bleeding, are less likely in this population.

Table 6: Complications Among Patients Noted Postoperatively (N = 60)

Complications	No. of Cases	Percentage
Vomiting	12	20%
Bleeding PV	1	1.67%

Table 7 compares the diagnostic validity of hysteroscopy and dilatation and curettage (D&C) across several categories. Hysteroscopy shows a high sensitivity of 95.23%, significantly outperforming D&C's sensitivity of 61.9%, indicating its superior ability to identify patients with the condition. Both procedures exhibit perfect specificity at 100%, meaning they correctly identify all patients without the condition. Additionally, both tests achieve a PPV of 100%, ensuring that all positive results are accurate. However, hysteroscopy also boasts a higher NPV of 96.66% compared to D&C's 78.37%, making it more effective at ruling out disease. Overall, hysteroscopy has an accuracy rate of 98%, while D&C's accuracy is 84%. This analysis underscores the preference for hysteroscopy as a more sensitive and accurate diagnostic tool in clinical practice.

Table 7: Comparison of Validities

Categories	Hysteroscopy (%)	Dilatation and Curettage (%)
Sensitivity	95.23	61.9
Specificity	100	100
Positive Predictive Value (PPV)	100	100
Negative Predictive Value (NPV)	96.66	78.37
Accuracy	98	84

Discussion

One of the most common conditions seen by patients who attend the gynaecology outpatient department is abnormal uterine bleeding. In this investigation, the oldest patient was 60 years old, while the youngest was 20. The age range with the highest occurrence was 40–49 years old, with 31 instances (51.67%). The largest age incidence, according to Swati Singh et al. [8], was between 31 and 40 years old, with a range of 22 to 70 years old. The largest age incidence, according to V Radha Lakshmi et al. [9], was between 46 and 50 years old. The age range of 46 to 55 years was the most prevalent among 60 patients in the Gazal Garg et al. [10] series. The average age of the patients was 36.4 ± 7.6 years, according to Parul Sinha et al. [11].

Most patients 50 had menorrhagia upon presentation, as shown in table number 2. Nine individuals in the second most prevalent group experienced polymenorrhea. Six of the patients included postmenopausal haemorrhage. In the V Radha Lakshmi et al series, menorrhagia was the most common bleeding pattern in 55% of cases, followed by polymenorrhagia in 13% of cases; in the Gazal Garg et al series, menorrhagia was observed in 43% of cases, followed by polymenorrhagia and oligomenorrhoea; and in the Swati Singh et al series, menorrhagia was followed by polymenorrhagia and oligomenorrhoea in 32% of cases. According to Parul Sinha et al., 36.1% of cases had intermenstrual haemorrhage, 36.1% involved menorrhagia, and 30.4% involved polymenorrhea. The most common finding among the 20 patients with abnormal hysteroscopy findings was an endometrial polyp (9 cases, 18%), followed by endometrial hyperplasia (7 cases, 16%), submucous myoma (3 cases, 6%), and one case (2%) of endometrial atrophy. Submucous myoma was found in 7% of patients, endometrial hyperplasia in 26%, and endometrial polyps in 8%

of cases, according to Swati Singh et al. 20% of patients had endometrial hyperplasia, 13% had endometrial polyps, and 11% had submucosal myomas, according to V Radha Lakshmi et al. Endometrial polyps accounted for 26.67% of all AUB cases, with submucous myomas for 23.33% of cases, according to Gazal Garg et al.; 18.33% of cases had a functional endometrium with a normal appearance, with endometrial hyperplasia following in 11.66% of cases; Parul Sinha et al. found endometrial polyps in 16.1% of cases and submucous myomas in 10% of cases.

Conclusion

Menstrual dysfunction remains one of the most important causes of illness and impairment among women of reproductive age worldwide; hence, proper and sensitive diagnostic techniques are often essential. Conventionally adopted techniques like dilation and curettage have failed to identify a cause in less than half of AUB cases; therefore, hysteroscopy, a superior diagnostic technique capable of directly visualizing the uterine cavity, is crucial for improved diagnosis accuracy and appropriate management strategies. Thus, the findings significantly contribute to our understanding of how hysteroscopy aids in the recognition of endometrial polyps, hyperplasia, and other pathologies, while also serving as an improvement tool for patient outcomes. A correlation between histopathologic analysis and observation during the hysteroscopy procedure validates its routine use in clinical gynecologic practice as more efficient and effective for better management of AUB cases.

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