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Hysteroscopic and Clinico-Pathological Evaluation of Abnormal Uterine Bleeding: A Retrospective Study

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Abstract: ***Background: Abnormal uterine bleeding (AUB) is a common gynaecological complaint affecting women of all reproductive age groups. Hysteroscopy enables direct visualization of the endometrial cavity and offers superior diagnostic capability compared to blind sampling techniques. Objective: To assess hysteroscopic findings in women with AUB and evaluate their correlation with histopathological examination (HPE). Methods: A retrospective observational study was conducted on 64 women presenting with AUB who underwent hysteroscopy followed by endometrial sampling over 2 years. Demographic data, clinical presentation, hysteroscopic findings, and HPE results were analyzed. Diagnostic performance was measured using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy. Results: The mean age was 42.3 ± 6.8 years. Menorrhagia (62.5%) was the most frequent symptom. Hysteroscopy detected endometrial polyps (42.6%) and submucous fibroids (19.7%) as the most common lesions. The highest concordance between hysteroscopy and HPE was observed for carcinoma (100%), followed by polyps and fibroids (both 91.7%). Hysteroscopy showed high diagnostic accuracy for polyps (89%) and fibroids (89%). Conclusion: Hysteroscopy is a reliable and accurate modality for evaluating AUB, demonstrating strong correlation with histopathological findings. Its routine use can enhance diagnostic accuracy and guide definitive management.***

Keywords: Abnormal uterine bleeding, hysteroscopy, histopathology, diagnostic accuracy, endometrial polyps, submucous fibroid

1. Introduction

Abnormal uterine bleeding (AUB) refers to bleeding from the uterine corpus that is irregular in volume, frequency, duration, or timing and is unrelated to pregnancy [1, 2]. It is a common gynaecological complaint that significantly impacts the physical, emotional, and social well-being of affected women, particularly in the perimenopausal age group [1, 2]. AUB is among the leading causes of outpatient visits and surgical interventions in gynaecology [1, 6].

Traditionally, diagnostic evaluation of the endometrium relied on blind procedures such as dilatation and curettage (D&C), which often fail to identify focal intrauterine lesions and have limited sensitivity [3]. In contrast, hysteroscopy allows direct visualization of the endometrial cavity and targeted biopsy, making it the current gold standard for the evaluation of intrauterine pathology [4, 5].

This study was undertaken to assess hysteroscopic findings in women presenting with AUB and to determine the correlation of these findings with histopathological examination (HPE), thereby evaluating the diagnostic accuracy of hysteroscopy.

2. Materials and Methods

Study Design and Setting:
This retrospective observational study was conducted in the Department of Obstetrics and Gynecology at Seth G.S. Medical College & KEM Hospital, Mumbai, over a period of two years. The study included women presenting with abnormal uterine bleeding (AUB) who underwent both diagnostic hysteroscopy and subsequent endometrial sampling for histopathological examination (HPE).

Study Population:
A total of 64 women aged over 18 years with clinical complaints of AUB and who underwent hysteroscopy followed by HPE were included in the analysis.

Inclusion Criteria:
- Women presenting with abnormal uterine bleeding
- Patients who underwent hysteroscopic evaluation followed by histopathological sampling
- Age ≥18 years

Exclusion Criteria:
- Women with contraindications to hysteroscopy (e.g., active pelvic infection, severe cervical stenosis)
- Patients in whom histopathological evaluation could not be performed
- Pregnant women
- Women with a known diagnosis of genital malignancy undergoing treatment
- Women with AUB secondary to non-gynecological causes (e.g., endocrine disorders, coagulation abnormalities, trauma)

Data Collection:
Demographic and clinical data, including age, presenting symptoms, and menstrual history, were retrieved from medical records. Hysteroscopic findings such as endometrial polyps, submucous fibroids, endometrial hyperplasia, adhesions, and other intrauterine abnormalities were noted. Corresponding histopathological reports were reviewed to determine the correlation with hysteroscopic diagnoses.

Statistical Analysis:
Data were analysed using SPSS software. Descriptive statistics were presented as means, standard deviations, and percentages. The chi-square test and Fisher's exact test were employed to assess the association between hysteroscopic and histopathological findings. Diagnostic performance was evaluated in terms of sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and overall diagnostic accuracy. Concordance was assessed using percentage agreement and Cohen's kappa statistic. A p-value of <0.05 was considered statistically significant.

3. Results

A total of 64 women presenting with abnormal uterine bleeding (AUB) were included in the study. The mean age was 42.3 ± 6.8 years, with a range of 25 to 58 years. Descriptive statistics, including means, standard deviations (SD), and proportions, were used to summarize demographic and clinical characteristics.

Clinical Profile
Menorrhagia was the most common presenting symptom, reported in 62.5% of patients, followed by polymenorrhea and intermenstrual bleeding, each accounting for 18.8%. Among the comorbidities, hypertension was noted in 18.8% and diabetes mellitus in 12.5% of cases. On pelvic examination, a normal-sized uterus was observed in 62.5% of women, whereas 37.5% had an enlarged uterus (Table 1).

Table 1: Demographic and Clinical Characteristics

Demographic/Clinical Characteristic	%	Number of Cases
Age (mean ± SD)	-	42.3 ± 6.8
Age Range	-	25–58
Parity		
- Nulliparous	21.2	14
- Parous	77.3	51
Menstrual History		
- Menorrhagia (Heavy menstrual bleeding)	60.6	40
- Polymenorrhea (Frequent menstrual bleeding)	18.2	12
- Intermenstrual bleeding (Spotting between periods)	18.2	12
Comorbid Conditions		
- Hypertension	18.2	12
- Diabetes Mellitus	12.1	8
Uterus Size		
- Normal size	60.6	40
- Enlarged	37.9	25

Hysteroscopic Findings
Hysteroscopic evaluation revealed endometrial polyps as the most frequent abnormality, identified in 42.6% of patients. Submucous fibroids were seen in 19.7%, endometrial hyperplasia in 16.4%, intrauterine adhesions in 4.9%, and endometrial carcinoma in 3.3% of cases (Table 2).

Table 2: Distribution of Hysteroscopic Findings

Hysteroscopic Finding	Number of Cases	Percentage (%)
Endometrial polyps	26	42.6
Submucous fibroid	12	19.7
Endometrial hyperplasia	10	16.4
Endometrial carcinoma	2	3.3
Intrauterine adhesions	3	4.9
Normal findings	8	13.1

Correlation with Histopathology
The correlation between hysteroscopic and histopathological findings showed high concordance for endometrial polyps (91.7%) and submucous fibroids (91.7%). Concordance for endometrial hyperplasia and carcinoma was 90% and 100%, respectively. Lower agreement was observed for intrauterine adhesions (66.7%) and normal endometrial findings (75%). (Table 3)

Table 3: Concordance Between Hysteroscopy and Histopathology

Pathology	Hysteroscopy (n)	Histopathology (n)	Concordant	Concordance (%)
Endometrial polyps	26	24	22	91.7
Submucous fibroid	12	13	11	91.7
Endometrial hyperplasia	10	11	9	90
Endometrial carcinoma	2	2	2	100
Intrauterine adhesions	3	2	2	66.7
Normal findings	8	12	6	75

Statistical Association

The association between hysteroscopic and histopathological diagnoses was statistically significant ($p < 0.05$), as assessed by the Chi-square test and Fisher's exact test where applicable, confirming diagnostic agreement across most pathology categories.

Concordance Analysis

Cohen's kappa (κ) statistic was used to assess the strength of agreement between the two diagnostic modalities. A κ value of 0.78 indicated substantial agreement, with an overall percentage agreement of 86.2%.

Diagnostic Performance of Hysteroscopy

The diagnostic efficacy of hysteroscopy was evaluated for common intrauterine pathologies:

Endometrial polyps: Sensitivity 92%, Specificity 85%, PPV 88%, NPV 90%, Accuracy 89%

Submucous fibroids: Sensitivity 89%, Specificity 90%, PPV 85%, NPV 93%, Accuracy 89%

Endometrial hyperplasia: Sensitivity 80%, Specificity 88%, PPV 83%, NPV 86%, Accuracy 85%. (Refer to Table 4 and Figure 2)

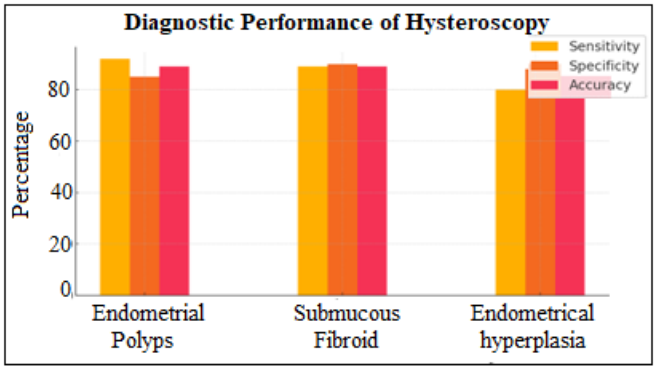

Figure 1: Bar chart demonstrating the diagnostic accuracy metrics of hysteroscopy for identifying common intrauterine pathologies in AUB. Parameters displayed include sensitivity, specificity and overall accuracy for endometrial polyps, submucous fibroids and endometrial hyperplasia.

4. Discussion

Abnormal uterine bleeding (AUB) is a prevalent gynaecological concern, affecting up to 30% of women of reproductive age and peaking in the perimenopausal group, making it one of the most common reasons for outpatient visits and surgical interventions in Gynecology [1, 2, 11, 16]. In our study of 64 women with AUB, hysteroscopy served as both a diagnostic and therapeutic modality, with histopathological examination (HPE) remaining the gold standard for confirmation [12].

Demographic and Clinical Profile

The mean age (42.3 ± 6.8 years) and parity distribution of our study population reflect similar demographics reported elsewhere [17, 18]. Menorrhagia predominated (62%), with polymenorrhea and intermenstrual bleeding accounting for 18.8% each, patterns consistent with FIGO's PALM-COEIN classification [11, 24]. Comorbid hypertension (18.8%) and diabetes mellitus (12.5%) in our cohort align with known associations between metabolic syndrome and AUB [2, 16].

Hysteroscopic Findings and Their Distribution

Hysteroscopic evaluation identified endometrial polyps in 42.6% of cases, submucous fibroids in 19.7%, and endometrial hyperplasia in 16.4%, echoing findings from prior studies [3, 4, 5, 23]. Polyps are frequently missed by blind curettage and transvaginal sonography but hysteroscopy enables direct visualization and targeted removal, reducing repeat procedures [3, 14, 5, 27]. Submucous fibroids detected hysteroscopically mirror the 15–25% prevalence in AUB cohorts [6, 18]. Hyperplasia and carcinoma, though less common, were found in 16.4% and 3.1% of women respectively, underscoring the need for careful inspection and biopsy to catch premalignant lesions [12, 14].

Concordance with Histopathology

Concordance between hysteroscopic diagnosis and HPE was excellent for polyps (91.7%) and fibroids (91.7%), similar to the 90–95% rates reported in the literature [7, 9, 19, 20]. Endometrial hyperplasia showed 90% concordance, while carcinoma reached 100%, validating hysteroscopy's reliability [5, 12, 28]. Lower agreement for normal endometrium (75%) and intrauterine adhesions (66.7%) may reflect subtle mucosal changes and sampling challenges [21, 22].

Diagnostic Accuracy of Hysteroscopy

Diagnostic performance analysis demonstrated excellent sensitivity and specificity for endometrial polyps (92% and 85%, respectively) and submucous fibroids (89% and 90%, respectively) [8, 21]. Endometrial hyperplasia showed moderate sensitivity (80%) and specificity (88%), reinforcing the importance of histopathological confirmation in such cases [21, 25]. The overall diagnostic accuracy exceeded 85%

across major pathology categories, affirming the role of hysteroscopy as a first-line investigative tool for AUB [4, 20].

Clinical Implications

Clinically, hysteroscopy's real-time visualization, therapeutic potential, and ability to perform one-step interventions can decrease healthcare utilization and improve patient outcomes [5, 27, 29, 30]. It allows targeted biopsy, reduces the likelihood of missed pathology, and facilitates one-step treatment in cases of polyps or fibroids [9, 29]. Furthermore, its utility in identifying malignant or premalignant lesions supports early detection and improved outcomes [12, 28].

5. Limitations

Limitations of our study include the single-centre design, modest sample size, and potential interpretive variability in hysteroscopic assessment and HPE sampling [23, 29]. Future multicentre trials with larger cohorts, blinded assessments, and integration of advanced imaging modalities are warranted to further refine hysteroscopic practice in AUB [3, 13].

Ethical Approval

Ethical approval for this study was obtained from the Institutional Ethics Committee of Seth G.S. Medical College & KEM Hospital.

Conflict of Interest

The authors declare no conflict of interest.

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