

Enhanced Precision in Diagnosing and Treating Abnormal Uterine Bleeding: A Comparative Analysis of Hysteroscopy versus Dilatation and Curettage

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Abstract

Background: Abnormal uterine bleeding (AUB) is a common gynaecological condition requiring accurate diagnosis and effective treatment. Hysteroscopy, dilatation, and curettage (D&C) are widely used procedures for managing AUB.

Aim and Objective: This study compares hysteroscopy's diagnostic accuracy, safety, and treatment of hysteroscopy D&C in women with AUB.

Materials and Methods: A prospective, comparative study was conducted on 200 women aged 30-50 presenting with AUB at a tertiary care centre. Participants were randomly assigned to undergo either hysteroscopy (Group A) or D&C (Group B). The primary outcomes included diagnostic accuracy, detection of intrauterine pathologies, procedure time, patient discomfort, and complication rates. Follow-up was conducted over six months to evaluate treatment outcomes.

Results: Hysteroscopy demonstrated a higher diagnostic accuracy (95%) compared to D&C (75%) for detecting intrauterine pathologies ($p < 0.001$). The mean procedure time was significantly shorter for hysteroscopy (28 ± 5 minutes) than for D&C (28 ± 6 minutes) ($p < 0.001$). Patient discomfort was lower in the hysteroscopy group (VAS score: 3.2 ± 1.1) compared to the D&C group (VAS score: 4.5 ± 1.3) ($p < 0.001$). The overall complication rate was lower in the hysteroscopy group (5%) compared to the D&C group (8%), though this difference was not statistically significant ($p = 0.41$). At six-month follow-up, 92% of women in the hysteroscopy group reported complete resolution of AUB symptoms, compared to 80% in the D&C group ($p = 0.02$).

Conclusion: Hysteroscopy is superior to D&C in diagnosing and treating AUB. It offers higher diagnostic accuracy, shorter procedure time, lower patient discomfort, and better treatment outcomes. Hysteroscopy should be considered the preferred modality for managing AUB, especially when precise diagnosis and targeted treatment are necessary.

Keywords: Abnormal Uterine Bleeding, Hysteroscopy, Dilatation And Curettage, Diagnostic Accuracy, Treatment Outcomes.

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Introduction

Abnormal uterine bleeding (AUB) is a prevalent and distressing condition affecting women of all ages, particularly those in the reproductive and perimenopausal phases. It accounts for many gynaecological consultations and poses a significant challenge in clinical practice due to its varied etiologies and the need for accurate diagnosis and effective treatment. [1] The causes of AUB range from hormonal imbalances to structural abnormalities of the uterus, such as fibroids, polyps, and malignancies. [2] Accurate diagnosis is essential to determine the appropriate therapeutic approach, as untreated or improperly managed

AUB can lead to anaemia, impaired quality of life, and, in some cases, severe reproductive complications. [3]

Dilatation and curettage (D&C) have traditionally been used as a diagnostic and therapeutic tool for managing AUB. This procedure involves scraping the endometrial lining of the uterus, providing tissue for histopathological examination. However, D&C has limitations, including incomplete sampling and the inability to visualize the uterine cavity directly. [4] These limitations may result in missed diagnoses of focal lesions such as polyps or

submucous fibroids, which are often responsible for AUB. [5]

Hysteroscopy, on the other hand, offers a direct visual inspection of the uterine cavity, allowing for targeted biopsies and immediate treatment of identified abnormalities. It is increasingly recognized as the gold standard for evaluating AUB due to its superior diagnostic accuracy and therapeutic potential. [6] Hysteroscopy can precisely identify intrauterine pathologies that may not be detected by D&C, leading to more tailored and effective treatment strategies. [7]

Despite its advantages, hysteroscopy remains widely used in many clinical settings, particularly where hysteroscopic facilities are not available or in cases where immediate intervention is necessary. The choice between these two methods often depends on the clinical context, availability of resources, and physician expertise. This study aims to compare the diagnostic accuracy, safety, and treatment outcomes of hysteroscopy and D&C in women presenting with AUB, thereby providing evidence-based guidance for clinicians in selecting the most appropriate modality for managing this condition.

Materials and Methods

Study Design: This prospective, comparative study was conducted at a tertiary care center over 12 months. The Institutional Ethics Committee approved the study, and written informed consent was obtained from all participants before enrollment.

Study Population: Two hundred women aged 30-50 years, presenting with abnormal uterine bleeding (AUB) and meeting the inclusion criteria, were recruited for the study. The inclusion criteria were as follows:

- Women with AUB persisting for more than three months.
- No history of hormonal therapy in the last three months.
- No known malignancy or pregnancy at the time of enrollment.

Exclusion Criteria Included:

- Women with severe anaemia (haemoglobin <7 g/dL).
- Contraindications for undergoing hysteroscopy and D&C.
- Previous endometrial ablation or surgery that could affect the uterine cavity.

Study Groups: The participants were randomly assigned to one of two groups:

- **Group A (Hysteroscopy Group):** 100 women underwent diagnostic hysteroscopy owed by targeted biopsy and therapeutic intervention as required.
- **Group B (D&C Group):** 100 women underwent dilatation and curettage (D&C) as the diagnostic and therapeutic procedure.

Randomization was performed using a computer-generated random number table. Due to the nature of the procedures, blinding was not feasible.

Procedures

Group A: Hysteroscopy: Hysteroscopy was performed in an outpatient setting using a 5 mm hysteroscope with normal saline as the distending medium. No general anaesthesia was used; however, local anaesthesia (paracervical block) was administered as needed for patient comfort. The uterine cavity was systematically inspected for polyps, fibroids, hyperplasia, and other abnormalities. Targeted biopsies were obtained from suspicious areas, and therapeutic interventions (e.g., polypectomy, myomectomy) were performed when necessary.

Group B: Dilatation and Curettage (D&C): D&C was performed under general anaesthesia in a day-care surgical setting. The cervix was dilated using Hegar dilators, and curettage was performed using a sharp curette. The endometrial tissue obtained was sent for histopathological examination. The procedure was completed within 30 minutes in most cases.

Outcome Measures

The primary outcome measures were:

1. **Diagnostic Accuracy:** The ability of hysteroscopy and D&C to correctly identify intrauterine pathologies (confirmed by histopathological examination).
2. **Detection Rate of Intrauterine Pathologies:** The number of cases in which polyps, fibroids, hyperplasia, or other abnormalities were identified.
3. **Procedure Time:** Time taken from the start of the procedure to its completion.
4. **Patient Discomfort:** Assessed using a visual analogue scale (VAS) immediately after the procedure.
5. **Complication Rates:** Including bleeding, infection, uterine perforation, and other adverse events.

Secondary outcomes included evaluating treatment efficacy over a six-month follow-up period, during which patients were assessed for symptom relief and the need for further interventions.

Statistical Analysis: Data were analyzed using

SPSS version 25.0. Continuous variables were expressed as mean \pm standard deviation and categorical variables as frequencies and percentages. Independent t-tests were used to compare continuous variables between the two groups, while chi-square tests were employed for categorical variables. A p-value of <0.05 was considered statistically significant.

Follow-up: All patients were followed up at 1, 3, and 6 months post-procedure to assess symptom relief, complications, and the need for further intervention. Patients were advised to report any recurrence of symptoms or adverse effects immediately.

The effectiveness of the treatment was determined by the absence of recurrent AUB and improvement in haemoglobin levels.

Results

Patient Demographics: The study enrolled two hundred women, with 100 women in each group (Group A: Hysteroscopy, Group B: D&C). The mean age of participants was 42.3 ± 5.4 years in the hysteroscopy group and 41.8 ± 5.7 years in the D&C group. There were no statistically significant differences in baseline characteristics between the two groups, ensuring comparability.

Table 1: Baseline Characteristics of Study Participants

Characteristic	Hysteroscopy Group (n=100)	D&C Group (n=100)	p-value
Mean age (years)	42.3 ± 5.4	41.8 ± 5.7	0.57
BMI (kg/m ²)	26.5 ± 3.1	26.2 ± 3.4	0.61
Parity (mean)	2.4 ± 1.1	2.5 ± 1.0	0.78
Duration of AUB (months)	6.7 ± 3.2	6.9 ± 3.5	0.74

Diagnostic Accuracy: Hysteroscopy demonstrated significantly higher diagnostic accuracy than D&C. Hysteroscopy correctly identified intrauterine pathologies in 95% of cases, whereas D&C had a diagnostic accuracy of 75% ($p < 0.001$).

Table 2: Diagnostic Accuracy of Hysteroscopy vs. D&C

Pathology	Confirmed Cases (Histopathology)	Detected by Hysteroscopy (n=100)	Detected by D&C (n=100)	p-value
Endometrial Polyps	30	29	22	0.03
Submucous Fibroids	25	24	18	0.04
Endometrial Hyperplasia	35	34	28	0.05
Endometrial Carcinoma	10	8	6	0.40
Total Diagnostic Accuracy (%)	-	95%	75%	<0.001

Procedure Time and Patient Discomfort: The mean procedure time was significantly shorter in the hysteroscopy group (20 ± 5 minutes) compared to the D&C group (28 ± 6 minutes) ($p < 0.001$). Patient discomfort, assessed using a visual ana-

logue scale (VAS), was also significantly lower in the hysteroscopy group (VAS score: 3.2 ± 1.1) compared to the D&C group (VAS score: 4.5 ± 1.3) ($p < 0.001$).

Table 3: Procedure Time and Patient Discomfort

Outcome Measure	Hysteroscopy Group (n=100)	D&C Group (n=100)	p-value
Mean Procedure Time (minutes)	20 ± 5	28 ± 6	<0.001
VAS Score (Patient Discomfort)	3.2 ± 1.1	4.5 ± 1.3	<0.001

Complications: The overall complication rate was low in both groups, but hysteroscopy had a slightly lower complication rate (5%) than D&C (8%), although this difference was not statistically significant ($p = 0.41$). The most common complications in both groups were minor bleeding and mild infection, both of which were managed conservatively.

Table 4: Complications

Complication	Hysteroscopy Group (n=100)	D&C Group (n=100)	p-value
Minor Bleeding	3	5	0.47
Mild Infection	2	3	0.68
Uterine Perforation	0	2	0.16
Total Complications (%)	5%	8%	0.41

Follow-up and Treatment Outcomes: At the six-month follow-up, 92% of women in the hysteroscopy group reported complete resolution of AUB symptoms, compared to 80% in the D&C group ($p = 0.02$). A smaller proportion of patients in the hysteroscopy group required additional intervention (8%) compared to the D&C group (20%).

Table 5: Treatment Outcomes at Six-Month Follow-Up

Outcome	Hysteroscopy Group (n=100)	D&C Group (n=100)	p-value
Complete Resolution of AUB	92%	80%	0.02
Need for Additional Intervention	8%	20%	0.02

Discussion

The present study aimed to compare the diagnostic accuracy, safety, and treatment outcomes of hysteroscopy and dilatation and curettage (D&C) in women with abnormal uterine bleeding (AUB). Our findings demonstrated that hysteroscopy significantly outperformed D&C regarding diagnostic accuracy, patient comfort, and overall treatment efficacy. These results are consistent with previous studies, further solidifying the role of hysteroscopy as the gold standard for evaluating and managing AUB.

In this study, hysteroscopy showed a diagnostic accuracy of 95%, which was significantly higher than the 75% observed with D&C ($p < 0.001$). These findings align with the results of a study by Clark et al., which reported diagnostic accuracy of 94% for hysteroscopy compared to 65% for D&C.⁵ The superior accuracy of hysteroscopy may be attributed to its ability to provide direct visualization of the uterine cavity, enabling the identification of focal lesions such as polyps and submucous fibroids that blind procedures like D&C. [1] may miss Additionally, hysteroscopy was for targeted biopsies, further enhancing its diagnostic precision. [8]

Our study found that hysteroscopy was associated with a shorter procedure time (20 ± 5 minutes) compared to D&C (28 ± 6 minutes) ($p < 0.001$). Similar findings have been reported in previous studies, where hysteroscopy is shown to be a quicker and more efficient procedure. [4] The shorter procedure time, coupled with the minimally invasive nature of hysteroscopy, significantly contributes to the reduced patient discomfort observed in our study. The lower VAS scores for pain in the hysteroscopy group (3.2 ± 1.1) compared to the D&C group (4.5 ± 1.3) ($p < 0.001$) underscore the patient-friendly nature of hysteroscopy also reported in other studies. [6]

The overall complication rate in our study was low, with hysteroscopy at a slightly lower rate (5%) compared to D&C (8%). Although this difference was not statistically significant ($p = 0.41$), the trend aligns with existing literature suggesting that hysteroscopy is a safer procedure with fewer complications. A systematic review by van Dongen et al. reported similar findings, with hysteroscopy associated with fewer adverse events compared to D&C. [6] The lower complication rates with hysteroscopy attributed to its direct visualization capability, which reduces the risk of uterine perforation

and other complications associated with blind procedures. [9]

At the six-month follow-up, 92% of women in the hysteroscopy group reported complete resolution of AUB symptoms, significantly higher than the 80% in the D&C group ($p = 0.02$). This finding supports previous studies that have demonstrated better long-term outcomes with hysteroscopy due to its ability to target and treat intrauterine pathologies precisely during the same procedure. [10] The need for additional interventions was also lower in the hysteroscopy group (8%) compared to the D&C group (20%), highlighting the therapeutic efficacy of hysteroscopy

e results of our study are in line with those reported by Bettocchi et al., who found that hysteroscopy is more effective than D&C in diagnosing and treating AUB, leading to higher patient satisfaction and fewer repeat procedures. [4] Additionally, our findings are corroborated by a study conducted by Cincinelli et al., which demonstrated that hysteroscopy provides superior diagnostic accuracy and offers a better therapeutic outcome in cases of endometrial hyperplasia and polyps. [7]

Limitations

Despite our study's strengths, including a well-defined patient population and robust methodology, there are limitations to consider. The study was conducted at a single tertiary care centre, which may limit the generalizability of the findings. Additionally, while randomization was used to assign participants to each group, blinding was not feasible due to the nature of the procedures, which could introduce some bias.

Conclusion

In conclusion, our study confirms that hysteroscopy is superior to D&C in diagnosing and treating AUB, offering higher diagnostic accuracy, shorter procedure time, lower patient discomfort, and better treatment outcomes. Given these advantages, hysteroscopy should be considered the preferred modality for evaluating and managing AUB, particularly in cases where precise diagnosis and targeted treatment are essential. Further multicenter studies with larger sample sizes are recommended to validate these findings and explore the cost-effectiveness of hysteroscopy compared to D&C in different clinical settings.

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