

A comparative study on the accuracy of pipelle endometrial biopsy versus conventional dilatation and curettage in patients for diagnosing the cause of abnormal uterine bleeding including post menopausal bleeding¹Dr. Chandana C., 3rd Year Postgraduate, Department of Obstetrics and Gynecology, SSMC, Tumakuru²Dr. Girish B.L., Professor, Department of Obstetrics and Gynecology, SSMC, Tumakuru³Dr. Indira H., Professor & HOD, Department of Obstetrics and Gynecology, SSMC, Tumakuru**Corresponding Author:** Dr. Chandana C., 3rd Year Postgraduate, Department of Obstetrics and Gynecology, SSMC, Tumakuru.**How to citation this article:** Dr. Chandana C., Dr. Girish B.L., Dr. Indira H., “A comparative study on the accuracy of pipelle endometrial biopsy versus conventional dilatation and curettage in patients for diagnosing the cause of abnormal uterine bleeding including post menopausal bleeding”, IJMACR- October - 2025, Volume – 8, Issue - 5, P. No. 127 – 135.**Open Access Article:** © 2025 Dr. Chandana C., et al. This is an open access journal and article distributed under the terms of the creative common's attribution license (<http://creativecommons.org/licenses/by/4.0>). Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.**Type of Publication:** Original Research Article**Conflicts of Interest:** Nil**Abstract**

Background: Abnormal Uterine Bleeding (AUB) is defined as bleeding from the uterus that is irregular in volume, frequency, duration, or timing and occurs outside of normal menstrual cycles. It is a commonly encountered gynaecological problem, it is reported to occur in 9 to 14% women between menarche and menopause. In India the prevalence is 17.9%. The aim was to compare accuracy of Pipelle endometrial biopsy versus conventional dilatation & curettage in patients for diagnosing the cause of abnormal uterine bleeding.

Materials and Methods: This cross-sectional study was conducted in Department of Obstetrics and Gynecology at SSMC among 99 women, Tumkur among all women above 35 year old age group as per

the inclusion and exclusion criteria. After getting the informed consent endometrial sampling with Pipelle was done then followed by Conventional dilatation and curettage under anesthesia to the same patient. Both samples were sent to pathologist which were screened at the laboratory for histopathology assessment and the results were compared

Results: There is a strong agreement between Pipelle sampling and D&C for most histopathological diagnosis. For instance, in proliferative endometrium, Pipelle demonstrated a sensitivity of 95.8% and a perfect specificity of 100%, correctly identifying 46 out of 48 cases. Similarly, secretory endometrium had a sensitivity of 89.5% with 100% specificity, while both forms of endometrial hyperplasia (with and without atypia) and adenocarcinoma were identified with 100%

sensitivity and specificity. However, the Pipelle's performance was notably lower for atrophic endometrium, with a sensitivity of 62.5% due to three false negatives, and particularly for endometrial polyps, where sensitivity dropped to 25% despite maintaining a specificity of 100%. These findings suggest that while the Pipelle method is highly reliable for most endometrial conditions, clinicians should be cautious and consider additional diagnostic approaches in cases of atrophic endometrium and suspected polyps.

Conclusion: Pipelle is a simple, convenient, safe and yet efficient tool for endometrial assessment. It can be done as an outpatient procedure without any anesthesia, less painful, cost effectiveness, easier to perform and fewer complications when compared to D&C which is done under anesthesia

Keywords: Abnormal Uterine Bleeding, Pipelle Endometrial Biopsy, Dilatation and Curettage.

Introduction

Abnormal Uterine Bleeding (AUB) is defined as bleeding from the uterus that is irregular in volume, frequency, duration, or timing and occurs outside of normal menstrual cycles. It is a commonly encountered gynaecological problem, it is reported to occur in 9 to 14% women between menarche and menopause. In India the prevalence is 17.9%, PALM-COEIN is given by International Federation of Gynecology and Obstetrics [FIGO] to classify the etiologies of Abnormal uterine bleeding. The first portion, PALM describes Structural issues, the second portion COEIN describes nonstructural issues. The N stands for "not otherwise classified"

Anovulatory cycles, Polyps, Endometrial hyperplasia, Polycystic ovarian syndrome, Thyroid disorders, hyperprolactinemia, Diabetes and Obesity can be

directly or indirectly be associated with abnormal uterine bleeding and endometrial pathology.

Histopathological report of endometrium is prerequisite in evaluation and management of Abnormal uterine bleeding, this requires endometrial sampling. AUB can arise from a wide variety of causes, including structural abnormalities, hormonal imbalances, and systemic disorders, which necessitate accurate diagnostic techniques to determine the underlying pathology. A prompt and reliable diagnosis is essential for effective treatment and management, as inappropriate or delayed treatment can lead to further complications such as anemia, infertility, or even endometrial cancer. Among the methods used to assess the cause of AUB, endometrial biopsy plays a crucial role in obtaining tissue samples from the uterine lining for histopathological examination.

Traditionally, **dilatation and curettage (D&C)** has been the gold standard for evaluating the endometrium in patients with abnormal uterine bleeding. **D&C** involves the mechanical dilation of the cervix followed by the scraping or suctioning of the endometrial lining. This procedure, though widely used, is invasive, requires anesthesia, and carries risks such as uterine perforation, infection, or injury to surrounding structures. Additionally, **D&C** may sometimes produce incomplete or inadequate tissue samples, which can affect the accuracy of the diagnosis. Despite these limitations, **D&C** has remained a common practice for diagnosing endometrial abnormalities, including polyps, hyperplasia, and malignancy.

In recent years, an alternative method for endometrial sampling has emerged as a less invasive option the pipelle endometrial biopsy. The pipelle biopsy is a device that allows for the collection of endometrial

tissue in an outpatient setting, without the need for anesthesia or cervical dilation. It is typically considered a more patient-friendly procedure, as it is less painful, faster, and associated with fewer complications compared to D&C. The pipelle is inserted into the uterine cavity, and a small sample of the endometrium is aspirated for examination. Although less invasive, the accuracy of the pipelle biopsy in diagnosing various causes of AUB, including endometrial hyperplasia, cancer, and polyps, has been a subject of research and debate.

The accuracy of both pipelle endometrial biopsy and D&C in diagnosing the cause of AUB depends on a number of factors, including the skill and experience of the clinician, the technique employed, and the characteristics of the patient's condition. Several studies have sought to compare the diagnostic accuracy of these two methods, often focusing on factors such as sensitivity, specificity, and the ability to provide definitive histopathological findings. Sensitivity refers to the ability of a test to correctly identify those with the disease, while specificity measures its ability to correctly identify those without the disease. A procedure with high sensitivity and specificity is ideal for accurately diagnosing the underlying cause of AUB.

While D&C is considered a reliable method, it is more invasive, and its use is often accompanied by higher patient discomfort and recovery time. On the other hand, pipelle biopsy, being a less invasive technique, has been shown to have comparable sensitivity in detecting endometrial abnormalities in certain cases. However, the efficacy of pipelle biopsy can be influenced by the quality and quantity of the endometrial sample collected, which may sometimes

be insufficient for conclusive diagnosis, particularly in cases of focal endometrial lesions or when the endometrium is thin.

Another crucial factor in comparing the two procedures is their diagnostic performance in detecting specific conditions. While D&C is considered the gold standard for diagnosing endometrial polyps and cancer, pipelle biopsy may have limitations in detecting small or focal lesions due to its sampling technique. In contrast, D&C allows for a broader and more thorough sampling of the endometrial lining, which may increase its diagnostic accuracy in certain situations. Nevertheless, pipelle biopsy has been reported to demonstrate a high degree of sensitivity and specificity for the detection of endometrial carcinoma, especially in women with thickened endometrium or abnormal imaging results, making it a valuable tool in the diagnostic workup of AUB.

The comparison between pipelle biopsy and D&C also involves the evaluation of patient outcomes, including patient satisfaction, complication rates, and the overall feasibility of the procedure in clinical practice. Many women experience anxiety and discomfort at the thought of undergoing a D&C, particularly due to the need for anesthesia and the potential for more invasive interventions. In contrast, the pipelle biopsy offers a less intimidating option for patients, with lower associated costs and the ability to perform the procedure in an office-based setting. Patient satisfaction and willingness to undergo further diagnostic testing are often higher with pipelle biopsy compared to D&C, especially when considering the reduced need for hospital admission and recovery time. Despite the benefits of pipelle biopsy, there are certain limitations that must be taken into account. One such

limitation is the potential for inadequate tissue sampling, particularly in patients with obesity or a retroverted uterus, where access to the endometrial lining may be more challenging. Moreover, while pipelle biopsy can effectively detect many common endometrial pathologies, there are certain situations where D&C may still be preferred, especially when a more comprehensive evaluation of the endometrial cavity is needed or when the clinical suspicion of malignancy is high. In these cases, D&C may provide a more thorough tissue sample, which can help guide treatment decisions and prevent misdiagnosis.

The aim of this study was to compare accuracy of pipelle endometrial biopsy versus conventional dilatation & curettage in patients for diagnosing the cause of abnormal uterine bleeding.

Materials and Methods

This cross-sectional study was conducted in Department of Obstetrics and Gynecology at Sri Siddhartha medical college and hospital, Tumkur from April 2023 to September 2024 among 99 participants after getting approval from Ethical committee among all women above 35 year old age group as per the inclusion and exclusion criteria's attending the OPD or admitted under OBG department, Sri Siddhartha Medical College and Hospital, Tumkur, Karnataka. When a women meeting the inclusion criteria attends the OPD, detailed history regarding the age, parity, occupation, socioeconomic status, duration of marriage, consanguinity of marriage, obstetric history, history of medical disorders, any history of malignancies in family is taken. The examinations including Per abdomen, per vaginal examination and per speculum examination will be done. After getting the informed consent endometrial sampling with Pipelle was done then followed by Conventional

dilatation and curettage under anesthesia to the same patient. Both samples were sent to pathologist which were screened at the laboratory for histopathology assessment and the results were compared.

Aim

To compare the diagnosis accuracy of Pipelle endometrial biopsy with conventional Dilatation and Curettage for diagnosing the cause of Abnormal uterine bleeding including postmenopausal bleeding.

Objectives

- To assess histopathological examination features in Pipelle Endometrial biopsy and Conventional Dilatation and Curettage.
- To compare histopathological reports obtained by both the methods in establishing the cause of Abnormal uterine bleeding

Inclusion Criteria

- Women above 35years of age with Abnormal uterine bleeding
- Both peri and postmenopausal bleeding
- Patients who have given written informed consent

Exclusion Criteria

- Cervical pathologies like cervical stenosis, obstructing cervical lesion and cervical malignancy
- Clotting disorders
- Active cervical or vaginal infection at the time of examination
- Acute Pelvic Inflammatory disease
- Thyroid disorders
- Thrombocytopenia (<1 lakh)
- Patients with Chronic obstructive pulmonary disease, Cerebrovascular accident and congenital heart disease

Results

Table 1: Distribution of Patients Based on Age

Age (Years)	Number	Percentage (%)
30–35	12	12.00
36–40	26	28.00
41–45	30	30.00
46–50	19	18.00
Above 50	12	12.00
Total	99	100.00

Table 2: Distribution of Patients Based on Parity

Parity	Number	Percentage (%)
Primipara without previous LSCS	8	8.00
Multipara without previous LSCS	56	56.00
Post LSCS without previous vaginal delivery	12	12.00
Post LSCS with previous vaginal delivery	24	24.00
Total	99	100.00

Table 3: Sample Adequacy with D&C and Pipelle (n=99)

Observation	Sufficient Sample	Insufficient Sample
D&C	97 (97.9%)	2
Pipelle	88 (87.3%)	11
P value	0.03	0.025

Graph 1:

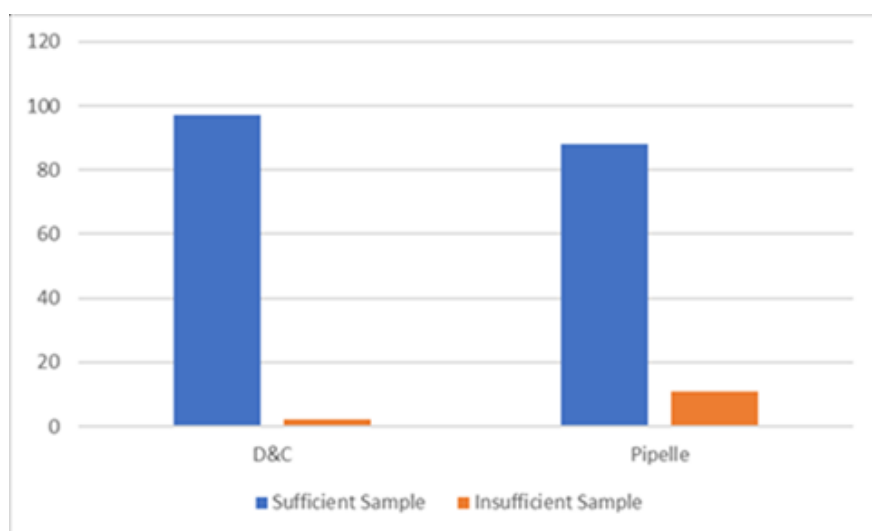


Table 4: Comparison of Pain Score between D&C and Pipelle (VAS Score) n=99

Pain Score	D&C Count (%)	Pipelle Count (%)	p value
1	0 (0.0%)	37 (37.4%)	<0.0001
2	0 (0.0%)	18 (18.2%)	<0.0001
3	0 (0.0%)	22 (22.2%)	<0.0001
4	3 (3.0%)	8 (8.1%)	0.12
5	3 (3.0%)	11 (11.1%)	0.03
6	4 (4.0%)	2 (2.0%)	0.41
7	4 (4.0%)	0 (0.0%)	0.04
8	13 (13.1%)	0 (0.0%)	0.0002
9	45 (45.5%)	0 (0.0%)	<0.0001
10	18 (18.2%)	0 (0.0%)	<0.0001

Table 5: Comparison of the Amount of Bleeding between Pipelle and D&C

Procedure	1 Gauze	2 Gauze	3 Gauze	Total
Pipelle	81	18	0	99
D&C	18	46	35	99
p value	0.045	0.0023	0.023	—

Table 6: Ease of Performing Procedure in Primipara without previous LSCS (n=8)

Procedure	Average Time Taken	Attempts
Pipelle	2.6 ± 1.02 minutes	Single
D&C	4.5 ± 1.89 minutes	Average more than one attempt
P value	<0.03	

Table 7: Ease of Performing Procedure in Multi Para without previous LSCS (n=56)

Procedure	Average Time Taken	Attempts
Pipelle	2.0 ± 1.93 minutes	Single
D&C	2.8 ± 1.03 minutes	Single
P value	>0.05 (not significant)	

Table 8: Specific Histopathological Reports with Pipelle and D&C

Diagnosis	D&C Count	Pipelle Count	p value
Proliferative Endometrium	48	46	0.79
Secretory Endometrium	19	17	0.70
Endometrial Hyperplasia without Atypia	11	11	-
Endometrial Hyperplasia with Atypia	4	4	-
Atrophic Endometrium	8	5	0.042

Endometrial Polyp	4	1	0.036
Endometrial Carcinoma	3	3	-

Graph 2:

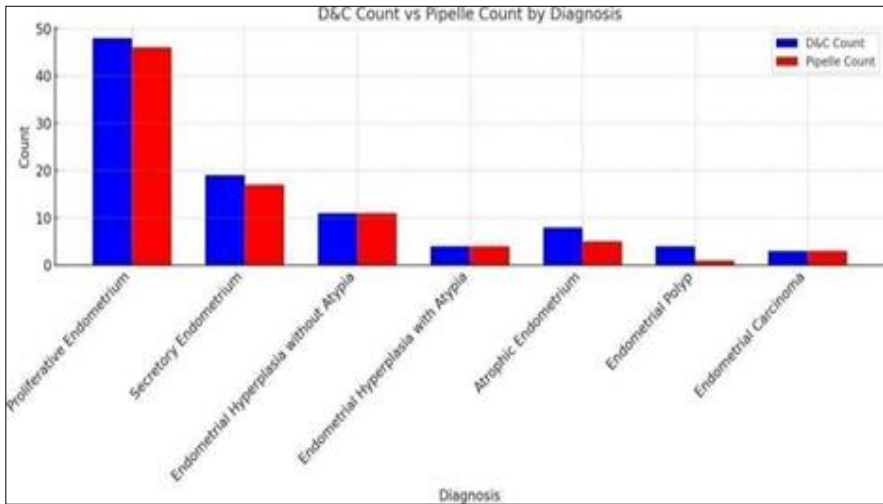


Table 9: Validity indicators of Pipelle sampling for various histopathological findings

Diagnostic	D&C (n=97)	Pipelle (n=88)	TP	FN	FP	TN	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Proliferative Endometrium	48	46	46	2	0	40	95.8	100	100	95.2
Secretory Endometrium	19	17	17	2	0	69	89.5	100	100	97.2
Endometrial Hyperplasia without Atypia	11	11	11	0	0	86	100	100	100	100
Endometrial Hyperplasia with Atypia	4	4	4	0	0	93	100	100	100	100
Atrophic Endometrium	8	5	5	3	0	73	62.5	100	100	94.3
Endometrial Polyp	4	1	1	3	0	84	25.0	100	100	96.6
Adenocarcinoma/Endometrial Carcinoma	3	3	3	0	0	94	100	100	100	100

Discussion

The age distribution by patient reveals quite notable trends into the demographic status of the sample population. There are 30 patients (30.00%) in the most popular group ranging from 41–45 because of fibroid, adenomyosis, followed by that of 36–40 patients with 26 (28.00%). In the 46–50 years category, 19 patients were found (18.00%). The 30–35, as well as the over 50 groups, each had 12 patients (12.00%). The parity distribution also affects the ease of sampling of the endometrium. Women with previous caesarean sections might possess different uterine anatomy that may

influence accessibility and efficacy of diagnostic tests such as Pipelle biopsy or dilatation and curettage (D&C). These findings emphasize the relevance of patient-based assessment according to reproductive history. Patients menopausal status is also a vital determinant of gynecological well- being. Out of the study group, 69 patients (70.00%) were premenopausal, and 30 (30.00%) were postmenopausal. 11 people with menorrhagia following amenorrhea who were mostly perimenopausal women and PCOS. In menorrhagia group majority had anovulatory cycles, fibroid uterus and adenomyosis. In metrorrhagia and menometrorrhagia majority had

submucosal fibroids. Patients had a varied spectrum of complaints, with the most frequent being postmenopausal bleeding (30.00%), followed by menorrhagia (28.00%), metrorrhagia (20.00%), menometrorrhagia (12.00%), and menorrhagia after amenorrhea (10.00%). Endometrial thickness is a very important parameter in assessing abnormal uterine bleeding. The most common finding was endometrial thickness in the range 6.1–8 mm in 42.5% of the patients. Other presentations were <4 mm (8.5%), 4.1–6 mm (12%), 8.1–10 mm (16%), 10.1–12 mm (8%), 12.1–14 mm (8%), and >14 mm (2%). Endometrial thickness >4 mm in postmenopausal women usually suspects malignancy and necessitates biopsy confirmation. The comparison of sample adequacy between Pipelle biopsy and D&C was carried out in the study. Although D&C was adequate in 97 out of 99 cases (97.9%), Pipelle was adequate in 88 cases (87.3%) and many of the cases were missed in Pipelle due to polypoidal endometrial growth which could not be adequately scraped. The statistically significant difference was observed ($p = 0.03$ and $p = 0.025$), showing that D&C is still better in sample adequacy. Pain measurement on the Visual Analog Scale (VAS) showed substantial differences between the two procedures. Pipelle biopsy was linked to lower pain scores, with 37.4%, 18.2%, and 22.2% of patients describing minimal discomfort (scores of 1, 2, and 3, respectively). On the other hand, D&C was linked to higher pain scores, with 45.5% and 18.2% of patients describing severe pain (scores of 9 and 10, respectively). The differences were significant statistically ($p < 0.0001$). The convenience of doing Pipelle in primipara patients is especially important because such patients have a smaller cervical canal, making standard D&C more

difficult and painful. Pipelle's flexible, single-use catheter design makes it easy to insert smoothly, minimizing procedure difficulty and pain. This ease makes Pipelle an ideal instrument for endometrial sampling among primipara. Multi para patients usually have a softer cervical canal as a result of previous deliveries, and thus the similarity in ease of both procedures may be accounted for by this. While Pipelle is still superior as far as lesser bleeding and discomfort are concerned, D&C might not be particularly problematic in this population. What this implies is that both procedures can be successfully employed in women with this obstetric history. shows comparison of sensitivity of pipelle in diagnosing the various endometrial histopathology as compared to D&C. It was comparable with D&C in those with Proliferative and secretory endometrium. The sensitivity was 100% in diagnosing endometrial hyperplasia with atypia, without atypia and endometrial carcinoma. A notable aspect of Pipelle versus D&C comparison is their role in endometrial pathology diagnosis. The findings show high concordance between the two methods for most histopathological diagnoses. For instance, proliferative endometrium was identified in 48 cases using D&C and 46 cases using Pipelle ($p = 0.79$), whereas secretory endometrium was identified in 19 and 17 cases, respectively ($p = 0.70$). In addition, both methods equally diagnosed endometrial hyperplasia with and without atypia, and endometrial carcinoma, indicating equal diagnostic accuracy. However, discrepancies were noted in the detection of atrophic endometrium and endometrial polyps. Pipelle identified only 5 of 8 atrophic endometrium ($p = 0.042$) and 1 of 4 endometrial polyps ($p = 0.036$), indicating lower sensitivity in these conditions. Despite this lack, Pipelle had a 100%

specificity in all the conditions, reflecting accurate positive diagnosis. These results show that while Pipelle is a very reliable diagnostic tool for most endometrial pathologies, clinicians must be careful in assessing atrophic endometrium and polyps. In these cases, other diagnostic approaches, e.g., hysteroscopy or imaging, might be needed.

Conclusion

Pipelle is a simple, convenient, safe and yet efficient tool for endometrial assessment. It can be done as an outpatient procedure without any anesthesia, when compared to D&C which is done under anesthesia. Sensitivity and Specificity in detecting endometrial hyperplasia and carcinoma were comparable with standard procedure D&C but it failed to detect endometrial polyp. Considering all the factors together, though Pipelle sampling failed to get sufficient sample in 11 cases. Comparing the other factors like less painful, cost effectiveness, more patient convenient, easier to perform, anesthetic morbidity, and fewer complications such as perforation, bleeding or infection, Pipelle sampling can be used as an effective screening procedure in an outpatient department.

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