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Original Research Article

Comparative study of pipelle and diagnostic curettage in obtaining endometrial sample in a woman with abnormal uterine bleeding

Deevi Hemasri[1]*, Chinthareddy Varalakshmi[2], Myneedhi Vineela[3]

[1]Department of Obstetrics and Gynecology, Katuri Medical College and Hospital, Chinakondrupadu, Guntur, Andhra Pradesh, India
[2]Department of Obstetrics and Gynecology, Osmania Medical College and Hospital, Hyderabad, Telangana, India
[3]Department of Obstetrics and Gynecology, Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India

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***Correspondence:**
Dr. Deevi Hemasri,
E-mail: deevihemasri@gmail.com

ABSTRACT

Background: Though the gold standard method of assessing endometrium was hysteroscopic biopsy, various methods of endometrial sampling methods are available among which pipelle and dilatation and curettage are more commonly used in routine practice in endometrial assessment in evaluating abnormal uterine bleeding cases, the main objective of the study to compare the efficacy of pipelle and D and C in obtaining endometrial sample in AUB cases.
Methods: A prospective study conducted on 200 AUB patients for a period of 1 year, first they underwent pipelle aspiration followed by dilatation and curettage in same setting.
Results: In our study histopathology report was available in 170 out of 200 patients in pipelle. HPR was available in all cases of D and C. Out of 200 patients with pipelle, sufficient sample was obtained in 152 patients (76%) and 48 patients had insufficient samples (24%). Out of 48 insufficient samples with pipelle, HPR available in 18 cases. In remaining 30 cases sample was inadequate for the histopathologist to give comment. In those 30 cases in pipelle D and C was successful in collecting report. In diagnosing endometrial carcinoma and hyperplasia pipelle showed 100% sensitivity and specificity.
Conclusions: Tissue diagnosis with pipelle apparatus can be quick and easy. Pipelle sampling can be utilized as a successful screening method in the outpatient department, having high specificity in identifying endometrial hyperplasia and carcinoma similar to D and C, as well as its cost-effectiveness, anesthetic morbidity, and intra and postoperative complications.

Keywords: AUB, Dilatation and curettage, Endometrial sampling, Pipelle

INTRODUCTION

Any disruption in the regularity, frequency, duration, or volume of menstrual flow, as well as non-menstrual disturbances of any kind, are considered as abnormal uterine bleeding (AUB).[1] It accounts for 70% of cases in peri and postmenopausal age group with gynecological symptoms, making it most prevalent presenting complaint in gynecology out-patient department.[2] Between 9% and 30% of women in the age of reproduction experience irregular periods that need for medical attention.

The diagnosis of AUB might be difficult due to its wide differential diagnosis range. Just 50 to 60% of instances have the origin of the bleeding identified, despite a complete history, multiple blood tests, and a thorough pelvic examination that frequently include transvaginal ultrasonography.[3]

It is estimated that abnormal uterine bleeding affects between 3% and 30% of women in the world who are of reproductive age, with occurrences rising around menarche and the perimenopause.

Numerous studies have been conducted on heavy menstrual bleeding (HMB), but the prevalence rises to 35 percent or higher when irregular and intermenstrual hemorrhage are included. It is difficult to ascertain the specific prevalence because a lot of women choose not to go to the doctor when they experience symptoms and because a diagnosis can have objective and subjective components.[4]

Endometrial curettage, ultrasound, and office-based techniques like hysteroscopy biopsy or endometrial samplers like Pipelle are among the diagnostic modalities used in endometrial assessment at AUB.[5,6] Since less than 1% of endometrial carcinoma cases occur in people under 35 and 6% in those under 45, endometrial assessments are recommended starting at age 40 to rule out endometrial hyperplasia or carcinoma.[7] Endometrial sample becomes required when a woman is determined to have high risk factors for endometrial disease, such as abnormal uterine bleeding during perimenopause, postmenopausal hemorrhage, or a history of prolonged anovulation.[8]

The workup of AUB requires a thorough medical history and physical examination. A woman is more likely to develop endometrial pathology if she has a history of prolonged anovulation, postmenopausal hemorrhage, or perimenopausal irregular uterine bleeding. Therefore, it becomes necessary to take endometrial samples from these women for histological assessment.

The most often used diagnostic method for AUB is dilatation and curettage. It has been determined that this approach is inconvenient due to the high expenses associated with hospital stays and operating room usage, as well as the risk of anesthetic, bed shortages, and problems. This approach has been replaced with good patient acceptability by quick, safe, and affordable office procedures such the Z sampler, Vibra, and pipelle biopsy device.[9]

Pipelle is made up of polypropylene material, a flexible instrument which uses suction mechanism to work. It is the best method for an outpatient endometrial biopsy since it can be put into the cervical canal without dilation.[10] Few research has examined the effectiveness of pipelle biopsy or verified this technique of endometrial sample using hysterectomy material in comparison to the gold standard histopathological diagnosis. For getting an endometrial biopsy in an outpatient situation, it is perfect.

It is beneficial for the diagnosis and treatment of endometrial cancer, infertility, precancerous hyperplasia and atypia, AUB workup, and cancer screening.[11] It has recently been discovered that endometrial aspiration biopsy is effective in the diagnosis of low-grade endometrial sarcomas and extrauterine cancer. Contradictory findings from many studies have been produced about the effectiveness of the Pipelle. While a positive biopsy is generally seen to be able to save costs and time, as well as spare patients inconvenience, a nonspecific result should be read carefully.[12]

The gold standard technique for endometrial evaluation is hysteroscopic biopsy, but it is not commonly available in developing nations. Conventional dilatation and curettage with sonography is the most commonly used method for endometrial evaluation in primary care settings (D and C). Office endometrial biopsy can hasten appropriate evaluation and treatment because it is less invasive than dilatation and curettage and does not require anesthesia.

In order to minimize the frequency of traditional D and Cs performed under general anesthesia, more research is required to ascertain the effectiveness of Pipelle as a tool for endometrial biopsy and to establish the dependability of Pipelle biopsy. The current study uses the histology results from D and C as a reference to assess the effectiveness of endometrial aspiration by pipelle in the diagnosis of AUB.

The study was carried to aimed at histopathological comparison of pipelle endometrial biopsy and D and C.

METHODS

It was a prospective study on patients with AUB in one year period from January 2023 to December 2023 in the department of obstetrics and gynecology in association with the pathology department in Katuri Medical College and Hospital. Approval from the Ethics Committee was obtained.

Inclusion criteria

Patients with AUB over 30 years of age, associated comorbidities like hypertension and diabetes, any endometrial thickness in premenopausal age and more than 4 mm thickness in postmenopausal age.

Exclusion criteria

Patients having stenosed cervix, lower genital tract infection, AUB due to extra uterine etiology, AUB due to cervical lesions, endometrial thickness of ≤4 mm in postmenopausal women.

Statistical analysis

Data were entered Microsoft excel and analyzed with statistical package for social sciences (SPSS) version 26.0. Results were expressed in frequencies, percentage, mean, standard deviation. A p value of less than 0.05 was considered statistically significant

The patients underwent a comprehensive examination, a thorough history was obtained, and the results were recorded. The following inquiries were carried out in accordance with pro: complete blood picture; urine examination; blood sugar and urea; VDRL, HIV, HBsAg

and HCV; USG- abdomen and pelvis along with endometrial thickness.

Method of data collection

The patient asked to lie in a dorsal position. We started by doing an endometrial aspiration operation with pipelle, to do this, the aspirator was introduced into the cervical canal while the cervix was held in place with tenaculum/vulsellum forceps. The piston was drawn back to create negative pressure once it reached the uterine fundus. Aspirated endometrial tissue sent for histopathology. The biopsy sample was put into a vial with the number 1 on it that contained 10% formaldehyde for tissue processing. Following an endometrial aspiration with pipelle, the cervix dilated and endometrial tissue was sampled using a sharp curette in the D and C process. The biopsy sample was put in bottle number two, which held 10% formaldehyde for HPE. We sent total of 200 samples each by both methods to pathology department. The sample's sufficiency and histopathological report was assessed by same pathologist.

RESULTS

The current study was done to assess the women with abnormal uterine bleeding by comparing histopathological findings of pipelle endometrial biopsy with D and C. In current study (Table 1), patients between 41-50 years constituted the maximum 112 (56%) and 4 (2.0%) patients were ≤30 years of age, 34 (17.0%) patients between 31-40 years of age, 42 (21.0%) were in 51-60 years of age group and 8 (4.0%) patients were 61-70 years of age and 75% (n=150) were premenopausal patients whereas 25% (n=50) were postmenopausal patients. Menorrhagia was the main complaint of premenopausal study subjects included in this study 94 (47%), menometrorrhagia 38 (19%) was the second one. Postmenopausal bleeding 50 (25%) is the main complaint in that age group. This study consists of, 16 (8.0%) nulliparous patients and 184 (92%) multiparous patients. Out the 200 patients 20 (10.9%) patients had c-section and 164 (89.9%) patients had NVD. Of them 174 (87.0%) patients were sterilized.

Table 1: Analysis of variables.

Variables	Frequency	Percentage
Age groups (in years)		
<30	4	2.0
31-40	34	17
41-50	112	56
51-60	42	21
61-70	8	4
Total	200	100.0
Menopausal status		
Pre-menopausal	150	75
Post-menopausal	50	25
Complaints		
Endometritis	2	1
Menometrorrhagia	38	19
Menorrhagia	94	47
Menorrhagia following amenorrhea	12	6
Metrorrhagia	4	2
Postmenopausal bleeding	50	25
Distribution of parity		
Nulliparous	16	8
Multiparous	184	92
Delivery		
C-section	20	10.9
NVD	164	89.1
Contraception		
Not-sterilized	26	13
Sterilized	174	87
Endometrial thickness (in mm)		
5-10	80	40
11-15	102	51
16-20	18	9

Table 2: Comparison between D and C and pipelle sampling.

	D and C (%)	Pipelle (%)
HPR obtained	200 (100)	170 (85)
HPR not obtained	0	30 (15)
Sample adequacy		
Insufficient	0	48 (24)
Sufficient	200 (100)	152 (76)

Of the study group 40% had endometrial thickness between 5-10 mm, 51% had ET between 11-15 mm, 9% had ET between 16-20 mm. In this study (Table 2), histopathological report (HPR) was available in 170 out if 200 patients in pipelle. HPR was available in all the cases of D and C.

In this study with pipelle, out of 200 patients, sample was sufficient in 152 patients (76%) and insufficient in 48 (24%), out of 48 insufficient samples of pipelle, HPR was available in 18 cases. In the remaining 30 patients, sample is inadequate for the histopathology reporting. Out of 200 cases, HPR was obtained from 170 cases using pipelles sampling, in 30 cases sample was insufficient to give the report.

In our study (Table 3), D and C was successful in giving report in those 30 cases in pipelle, where HPR was not available, showing the following reports, 8 them showed secretory endometrium, 4 atrophic endometrium, remaining showed proliferative endometrium (Table 4). In diagnosis of endometrial carcinoma and hyperplasia, pipelle showed 100% sensitivity and specificity.

Table 3: Distribution of HPE-report- pipelle and D and C.

Endometrial pattern	HPE-report- pipelle		HPE-report- D and C	
	Frequency	Percentage	Frequency	Percentage
Adenocarcinoma	2	1.0	2	1.0
Atrophic	4	2.0	8	4.0
Blood clot	4	2.0	0	0.0
Disordered proliferative	46	23.0	56	28.0
hyperplasia (atypia)	14	7.0	14	7.0
No report	30	15.0	0	0.0
Proliferative	64	32.0	74	37.0
Secretory	36	18.0	46	23.0
Total	200	100.0	200	100.0

Table 4: Validity of pipelle endometrium sampling for each endometrial condition.

Validity of Pipelle	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Adenocarcinoma	100	100	100	100
Hyperplasia	100	100	100	100
Proliferative	100	92.6	82.1	100
Disordered proliferative	100	93.5	82.1	100
Secretory	100	96.3	85.7	100
Atrophic	100	97.9	80	100

DISCUSSION

The present study was a prospective study of D and C and Pipelle comparison of endometrial sampling in subjects with AUB. This study was conducted between January 2023 and December 2023 at Department of obstetrics and gynecology, KMCH. Total 200 patients were included in this study.

Mude et al revealed that the focus of this clinical correlation diagnostic study was the comparison of pipelle endometrial sampling versus D and C in terms of gathering an adequate endometrial sample for histopathological diagnosis. Between 41- and 45-years age, AUB presentations are more common. AUB was used for less than six months duration in the majority of individuals (45%). Of the study population, 94% of the women were premenopausal or perimenopausal, and 6% were postmenopausal. Of the women in the study group, 96% were parous and 4% were nulliparous. Atrophic endometrium (4%), non-secretory phase in (4%), endometrial polyp (2%), proliferative phase of the endometrium (20%), secretory phase (11%), disordered proliferative phase (11%), hyperplasia without atypia (21%), and hyperplasia with atypia (2%), non-malignant 14 %, early secretory phase (1%), late secretory phase (1%), endometrial carcinoma (1%), endometrial glandular hypertrophy (1%). The chi square test reveals that pipelle has a 98.9% sensitivity and a 100% specificity for collecting enough tissue when compared to D and C. There

was a 100 percent positive predictive value and an 85.7% negative predictive value. The computed p value was less than 0.001, indicating statistical significance. According to our data, the majority of patients with AUB were between the ages of 41 and 50, and their primary complaint was menorrhagia. Of the women in our study, 75% were pre and perimenopausal, and 25% were post-menopausal. Proliferative endometrium 74 (37.0%) was the most common endometrial pattern found in our investigation with D and C whereas 64 (32.0%) with pipelle and it was statistically significant ($p<0.00001$), ($z=10.545$) The chi-square test indicates that pipelle has a 92.6% sensitivity and 100% specificity for collecting enough tissue when compared to D and C.[13]

Sarfraz et al study aimed to evaluate the histological results and level of diagnostic appropriateness in individuals who present with abnormal uterine bleeding after undergoing pipelle endometrial biopsies. a cross-sectional descriptive analysis of 220 pipelle biopsies, 65 (29.54%) were deemed insufficient for evaluation, and 155 (70.45%) were deemed sufficient for establishing a conclusive diagnosis through histological analysis. Chronic endometritis was the most prevalent pattern among the diagnostic samples, occurring in 70 cases (45.16%). Additional histological patterns included endometrial hyperplasia (3.87%), atrophic endometrium (4.51%), exogenous hormone impact (7.10%), proliferative endometrium (29.03%), secretory endometrium (9.03%), and endometrial cancer (1.29%). Out of 200 pipelle biopsies used in the current investigation, 48 (24%) were deemed insufficient for assessment, and 152 (76%) were found to be sufficient for a definitive histological examination diagnosis. The most prevalent pattern found in 64 (32%) of the samples was proliferative endometrium.[14]

Comparison of adequacy of endometrial sampling with pipelle versus conventional dilatation and curettage in abnormal uterine bleeding showed that 84.44% (n=38) in group A and 91.11% (n=41) in group B have adequate sample. P value was 0.33, showing insignificant difference.[16]

Moghaddam et al, completed the study on 50 people, in the pipelle group, the insufficient sample with 34% proliferative, in D and C group only 4% samples are insufficient. A total of 23 samples from 50 patients undergoing pathologic diagnosis were obtained from two similar sampling methods. In pipelles insufficient samples were 34% followed secretory and proliferative samples (56%), diagnostic accuracy of pipelle in polyp was 2%, in D and C it was 38% and accommodation of the pipelle and D and C samples in proliferative has allocated the highest percentage, and the lowest accommodation was in the in atrophy and polyps and hyperplasia. The average duration of the procedure in the pipelle group was significantly lower than D and C. The pain was significantly higher in pipelle group than D and C ($p<0.05$). In our study 24% insufficient sample noted with pipelle and no sample was insufficient with D and C, pipelle showed 32% proliferative samples and 18% secretory samples whereas D and C showed 37% proliferative samples and 23% secretory samples, average duration of time with pipelle was minimal in our study also with significantly higher pain than D and C.

Abdelazim et al found that 100% of the samples obtained by conventional D and C, while 97.9% of the samples obtained by the Pipelle device were adequate for histopathological examination. The pathological examination of 140 samples obtained by conventional D and C revealed proliferative endometrium in 37 specimens, secretory endometrium in 33 specimens, endometrial hyperplasia in 49 specimens (45 without atypia and 4 with atypia), endometritis in 8 specimens, endometrial polyps in 3 specimens and malignant endometrium in 10 specimen 18 curettage in abnormal uterine bleeding shows that 84.44% (n=38) in group A and 91.11% (n=41) in group B have adequate sample. P value was 0.33, showing insignificant difference.

Solanki et al found that AUB affects women of all ages and is a prevalent one. The results showed that the proliferative endometrium had the following characteristics: sensitivity, specificity, PPV, NPV, accuracy was 92%, 96%, 98.6%, 80%, and 93% respectively. Specificity, NPV, and accuracy were 100%, 99%, and 99%, respectively, with regards to atrophic endometrium. When it comes to identifying endometrial abnormalities, including cancer and endometrial hyperplasia, the pipelle curette and the Karman cannula endometrial aspiration biopsy are both simple, effective, and safe OP endometrial sample procedures. In the current investigation, pipelle demonstrated 100% sensitivity and specificity for the diagnosis of endometrial hyperplasia and endometrial cancer. Secretory endometrium, the corresponding values were 100% and 96.3%. In contrast, NPV and PPV were 100% and 85.7%, respectively. Sensitivity, specificity, PPV, and NPV for proliferative endometrium were 100, 92.6%, 82.1%, and 100%, respectively.[15]

Moghaddam et al, a study involving 50 patients was carried out, with 23 samples undergoing pathologic diagnosis from two comparable sampling techniques. Just 4% of the biopsy sample are insufficient, compared to 34% in the pipelle group insufficient samples. Within the pipelle group, the insufficient sample accounted for 34% of the total, while the secretion and proliferative samples accounted for the second and third places (56%). The accuracy of polyp diagnosis was 2% for pipelle and 38% for D and C. The proliferative samples exhibited the highest percentage of accommodation (9%), while the atrophy, polyps, and hyperplasia samples showed the lowest percentage of accommodation. The pipelle group's method took an average of considerably less time than D and C. The pipelle group experienced much more pain than the D and C group ($p<0.05$). In our investigation, there was a 24% insufficient sample with pipelle, while there was a 100% sufficient sample with D and C. The proliferative

phase was the highest accommodation, followed by the secretory phase. The average procedure duration was also lower with pipelle, and the discomfort was much higher with pipelle.[16]

Ashraf et al study in 2021, 84.44% (n=38) in group A (D and C) and 91.11% (n=41) group B (pipelle group) of the study, comparative adequacy of endometrial sampling with pipelle versus conventional dilatation and curette in abnormal uterine bleeding, indicated that the samples were sufficient. The p value of 0.33 indicated a negligible variation. Additionally, 152 out of 200 patients with pipelle and every patient with D and C have an adequate sample size in our study.[17]

Balaram et al conducted a study on 100 AUB patients and found that 92 patients were parous women and 8 patients were nulliparous.[18] Using the chi square test, the pipette's sensitivity in extracting sufficient tissue as compared to D and C was determined to be 96.7%, while its specificity was 85.7%. 98.9% was the positive predictive value while 66.7% was the negative predictive value. The results suggest that pipelle is just as effective as D and C for getting a sufficient sample of endometrial tissue. Of the individuals, endometrial thickness of 4.0 mm was observed in 5%, 12-16 mm in 31%, 5-8 mm in 30%, 9-12 mm in 26%, and >16 mm in 8%. The study group's mean±SD was 10.96±3.9. It was found in this investigation that greater thickness of endometrium not always increases the adequacy of tissue diagnosis. For 93% of patients in D and C sampling and 92% of patients in pipelle sampling, the sample was adequate. Proliferative phase endometrium was the most frequently found endometrial pattern (44%). The second most prevalent kind was secretory phase endometrium (31%) and was followed by simple hyperplasia (9%).

In our study out of 200 women 184 are multiparous and 16 were nulliparous, sample was sufficient in 100% cases of D and C 76% cases of pipelles. Endometrial thickness of 5 to 10 mm noted in 40% patients, 11 to 15 mm was noted in 51% and 9% was between 16 to 20 mm, most common finding was proliferative 32% followed by secretory endometrium 18% in both.[18]

Mamatha et al compared efficacy of endometrial aspiration biopsy using pipelle device versus dilatation and curettage (D and C) on histopathology.[19] Upon ruling out other causes of AUB, endometrial sampling with pipelle was done in 81 patients, followed by formal D and C under anesthesia. The samples were labelled A and B and sent to a histopathologist who was unaware of the sampling method. Both samples' histopathology reports were compared. Rising endometrial thickness was not found to be always associated with adequate tissue diagnosis. In our study, comparing pipelle with D and C, instrumentation with pipelle had 100% sensitivity, 92.6% specificity, PPV 82.1%, NPV 100% for endometrium in proliferative phase. The specificity, sensitivity PPV, NPV, accuracy rate was 100% in endometrial CA and endometrial hyperplasia. The sensitivity was 100% and specificity was 93.5% in disordered proliferative endometrium.[19]

Comparison of adequacy of endometrial sampling with pipelle versus conventional dilatation and curettage in abnormal uterine bleeding shows that 84.44% (n=38) in group A and 91.11% (n=41) in group B have adequate sample. P value was 0.33, showing insignificant difference.

Ilavarasi et al showed for endometrial hyperplasia, the pipelle biopsy's sensitivity, specificity, positive and negative predictive values, and accuracy were 64.2%, 88.8%, 94.1%, 85.5%, and 47.3%; for endometrial cancer, these values were 75%, 100%, 100%, 97.9%, and 98%, respectively. For both the statistically significant p value was 0.001. In our study with pipelle both for endometrial hyperplasia and endometrial adenocarcinoma, the sensitivity and specificity were 100%.[20]

Farzaneh et al ,2017 demonstrated a comparison of the effectiveness of dilatation curettage (D and C) and pipelle aspiration as an office biopsy procedure in 200 patients of AUB. The patients in this cross-sectional study were divided into two groups using the permuted block design method. Dilatation and curettage (D and C) was carried out in an operating room for the second group (n=100), while pipelle biopsy was done in an office setting for the first group (n=100). In the first group 88% of the samples were sufficient, and in the second group 98% were sufficient. For statistical analysis, the Fisher test was employed. It was found that there was a statistically significant difference (p=0.01) in the histology and sample effectiveness between pipelle biopsy and dilatation curettage (D and C). The obtained data showed that pipelle biopsy has a high level of efficacy. Totally this procedure is safe and cost-effective alternate to dilatation curettage (D and C) in AUB approach with low complications. In this study with pipelle, out of 200 patients, sample was sufficient in 152 patients (76%) and all patients of dilatation and curettage.[21]

This study has not focused on AUB cases below 30 years of age, AUB with stenosed cervix, cervical lesions and endometrial thickness of less than 4 mm in postmenopausal age.

CONCLUSION

Tissue diagnosis with pipelle apparatus can be quick and easy. As opposed to D and C, which is performed under anesthesia, this operation can be performed as an outpatient procedure (OP) without the need for anesthesia. The method's sensitivity and specificity in identifying endometrial hyperplasia and cancer were found to be similar to those of the conventional D and C operation. Pipelle apparatus failed to detect endometrial polyp. Taking into account all the variables, pipelle sampling can be utilized as a successful screening method in the outpatient department, even though it was unable to obtain

a sufficient sample in 15% of cases. In contrast it is having high specificity in identifying endometrial hyperplasia and carcinoma, as well as its cost-effectiveness, anesthetic morbidity, and intra and postoperative complications.

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REFERENCES

1. Munro MG, Critchley HO, Broder MS, Fraser IS. FIGO Working Group on Menstrual Disorders. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. Int J Gynaecol Obstet. 2011;113:3-13.
2. Shams G. Comparison of pipelle de cornier with conventional dilatation and curettage in terms of patients' acceptability. J Postgrad Med Inst. 2012;26(4):418-21.
3. Kotdawala P, Kotdawala S, Nagar N. Evaluation of endometrium in peri-menopausal abnormal uterine bleeding. J Midlife Health. 2013;4(1):18-21.
4. Liu Z, Doan QV, Blumenthal P, Dubois RW. A systematic review evaluating health-related quality of life, work impairment, and health-care costs and utilization in abnormal uterine bleeding. Value Health. 2007;10(3):183-94.
5. Yasmin F, Farrukh R, Kamal F. Efficacy of pipelle as a tool for endometrial biopsy. Biomedica. 2007;23(July-December):116-9.
6. Sanam M, Majid MM. Comparison the diagnostic value of dilatation and curettage versus endometrial biopsy by pipelle- a clinical trial. Asian. 2015;16(12):4971-5.
7. Choudary A, Javaid M. Clinical usefulness of pipelle endometrial sampling. Pak Armed Forces Med J. 2005;2.
8. Seltzer V, Benjamin F, Deutsch S. Perimenopausal bleeding patterns and pathologic findings. J Am Med Women's Assoc. 1990; 45:132.
9. Tanriverdi HA, Barut A, Gün BD, Kaya E. Is pipelle biopsy really adequate for diagnosing endometrial disease? Med Sci Monit. 2004;10:CR2714.
10. Shams G. Comparison of pipelle de cornier with conventional dilatation and curettage in terms of patients' acceptability. J Postgrad Med Inst. 2012;26:418-21.
11. Zuber TJ. Endometrial biopsy. Am Fam Phys. 2001;63(6):1131-5.
12. Ferry J, Farnsworth A, Webster M, Wren B. The efficacy of the pipelle endometrial biopsy in detecting endometrial carcinoma. Aust N Z J Obstet Gynaecol. 1993;33(1):76-7.
13. Mude V, Gunakala K, Rekharao PM, Sahaja S. comparison of pipelle endometrial sampling versus dilatation and curettage in cases of abnormal uterine bleeding. Eur J Mol Clin Med. 2022;9(4):2338-59.
14. Sarfraz T, Tahir H, Wazir L, Tariq H, Khan SA, Jaffar SR. Diagnostic adequacy and histological outcome of pipelle and endometrial biopsies. Pak Armed Forces Med J. 2021;71(1):57-61.
15. Solanki K, Kochar S, Poonia L, Gaur P, Poonia K, Choudhary S. A comparison of endometrial sampling histopathology by pipelle curette versus Karman cannula in patients with abnormal uterine bleeding at a tertiary care hospital in northwest Rajasthan. J Curr Res Sci Med. 2021;7(2):87-92.
16. Moghaddam TG, Hedayatifar F, Nouri B. Comparing the pipelle with dilatation and curettage (D and C) in diagnostic power of sampling for evaluating the patients with abnormal uterine bleeding. Int J Med Invest. 2018;7(1):56-67.
17. Ashraf F, Zafar H, Naz M, Fatima U, Fatima A. Comparison of endometrial sampling with pipelle versus conventional dilatation and curettage in abnormal uterine bleeding. Professional Med J. 2021;28(9):1234-8.
18. Balaram MS, Shinde RR, Babu CS, Mubasher HMM, Shinde RV. Role of pipelle versus dilatation and curettage in tissue diagnosis abnormal uterine bleeding. Int J Res Med Sci. 2020;8(9):3223-9.
19. Mamatha S, Lakshmikantha G. A comparative study between pipelle endometrial sampling and dilatation curettage in abnormal uterine bleeding. Intel J Clin Obstet Gynaecol. 2020;4(1):171-6.
20. Ilavarasi CR, Jyothi GS, Alva NK. Study of the efficacy of pipelle biopsy technique to diagnose endometrial diseases in abnormal uterine bleeding. J Midlife Health. 2019;10(2):75-80.
21. Farzaneh F, Mohammadi M, Niazi A, Eamaeilzadeh A, Rezaei S. Comparison of efficacy of pipelle biopsy with dilatation and curettage. Zahedan J Res Med Sci. 2017;19(12):1.

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