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Original Research Article

Diagnostic accuracy of office based endometrial biopsy when compared with subsequent findings of dilatation and curettage in patients with abnormal uterine bleeding in age group of 25 to 45 years

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ABSTRACT

Background: Endometrial sampling is considered the gold standard method for assessing Abnormal uterine bleeding (AUB). The primary objective of this study was to assess the diagnostic accuracy of office based endometrial biopsy using Pipelle method when compared with subsequent findings of Dilatation and Curettage (D&C) which is an inpatient procedure and to make a comparative analysis between these two approaches.
Methods: This was a prospective study carried out in the Department of Obstetrics and Gynaecology of Dr. Babasaheb Ambedkar Memorial Hospital, Central Railway, Mumbai over a period of one year on 100 gynaecological patients with one or more than one episode of abnormal uterine bleeding. Pipelle endometrial biopsy was taken on OPD basis and patients were subjected to D&C subsequently. Endometrial samples obtained using both methods then sent to the Department of Pathology for adequacy of sample and for histopathological analysis.
Results: In my study, I got adequate sample in 100% of cases of D&C whereas with pipelle, one sample was inadequate. Sensitivity, specificity, positive and negative predictive value of pipelle for diagnosing atrophic endometrium, secretory phase endometrium, simple endometrial hyperplasia was 100% and for proliferative phase endometrium it was 99% when compared with that of D&C.
Conclusions: Endometrial sampling by suction curette device is an inexpensive, safe OPD procedure that appears to be a feasible alternative to more invasive procedure like D&C for evaluation of patients with abnormal uterine bleeding in reproductive and premenopausal patients.

Keywords: Abnormal uterine bleeding, Dilatation and curettage, Pipelle endometrial biopsy

INTRODUCTION

The term "abnormal uterine bleeding (AUB)" refers to any deviation from typical menstrual patterns in terms of their frequency, regularity, or duration, and it also encompasses instances of bleeding that occur between regular menstrual cycles, known as intermenstrual bleeding (IMB).[1,2] This contrasts with dysfunctional uterine bleeding (DUB), which is identified through the process of eliminating pregnancy, medical interventions, systemic disorders, and abnormalities in the genital tract as potential causes.[3]

AUB is the primary reason for gynaecological referrals among women of reproductive age. It holds significant importance and requires thorough evaluation, especially in perimenopausal and menopausal women.[4-6] Abnormal uterine bleeding affects a substantial number of women globally, with estimated prevalence rates ranging from 3%

to 30%. The incidence tends to be higher during specific life stages like menarche and perimenopause. While numerous studies primarily focus on heavy menstrual bleeding (HMB), when we also consider irregular and bleeding between periods (intermenstrual bleeding), the prevalence increases to 35% or even higher.[7]

Endometrial sampling is considered the gold standard, most reliable and widely accepted method for assessing AUB.[8] Several different methods of endometrial sampling are utilized in clinical practice for diagnostic purposes. Among these methods, dilatation and curettage (D&C) has historically been one of the most commonly employed techniques. Nevertheless, it has become less preferred over time due to the associated risks of anaesthesia, potential complications, invasive and expensive.[9-12] Therefore, endometrial biopsy has gained extensive popularity as a method for endometrial biopsy in contemporary practice. endometrial biopsy is known for its safety, cost-effectiveness, and non-invasive nature compared to D&C. Complications associated with this method are exceedingly rare. Moreover, it does not require an operating room or anesthesia.[11,12] The efficacy of endometrial biopsy has been reported in several studies as 93%, 97%, 98%.[13-15]

Therefore, in younger patients experiencing abnormal uterine bleeding, choosing endometrial biopsy is often a preferable alternative for diagnosing the underlying cause of the bleeding. This option offers nearly equal diagnostic accuracy to the more invasive dilatation and curettage (D&C) while EB being less invasive and safer. Multiple studies that have compared the diagnostic accuracy of dilatation and curettage (D&C) with aspiration biopsy have consistently found that aspiration biopsy is just as accurate as D&C in diagnosing various endometrial pathologies.[9,10,14] But very limited studies have been done to assess the diagnostic accuracy of endometrial biopsy over D&C in AUB. Hence, the primary objective of the current study is to assess the diagnostic accuracy of endometrial sampling through office based endometrial biopsy when compared with subsequent dilatation and curettage (D&C) and to make a comparative analysis between these two approaches.

METHODS

Study design, sample size and source of data

This was a prospective study carried out on 100 gynaecological patients with one or more than one episode of abnormal uterine bleeding, at Dr. Babasaheb Ambedkar Memorial Hospital, Central Railway, Mumbai, over a period of one year from July 2011 to July 2012.

Women in age group of 25-45 years whose bimanual pelvic examination revealed normal to bulky uterus with or without any obvious uterine or adnexal pathology and who were willing to give informed written consent, were included in the study.

Patients with recent or active pelvic inflammatory disease, acute cervicovaginal infection, active uterine bleeding, current intrauterine pregnancy, uterine size more than 12 weeks, cancer cervix, postmenopausal bleeding were excluded from the study.

Method of data collection

In this study, patients were scheduled for an outpatient department (OPD) visit during the premenstrual phase. A complete history including patterns, previous menstrual history, obstetric history, past medical and surgical history, previous history of curettage and management, family and personal history was elicited. A thorough gynaecological examination was done and provisional clinical diagnosis was made.

Endometrial biopsy: After providing a detailed explanation of the procedure and obtaining written informed consent from each patient, endometrial biopsies were performed in the OPD without the use of anaesthesia. A disposable endometrial suction curette with specific dimensions (282 mm length, 3 mm outer diameter) was employed for the biopsy. The instrument included a sterile, flexible polypropylene sheath with an aspiration port and a polyethylene piston. In the lithotomy position, the cervix's anterior lip was secured using a vulsellum, allowing for the passage of the suction cannula through the cervical canal to the uterine fundus. Following this, the sheath was rotated and moved in various directions, and after retracting the piston, the sheath or cannula was removed from the uterus. The collected sample was preserved in formalin solution for subsequent histopathological examination. Throughout the procedure, detailed records were maintained, including the patient's pain score, which was assessed using a visual analogue scale (Figure 1). This allowed for the evaluation of the patient's discomfort or pain experienced during the biopsy process.

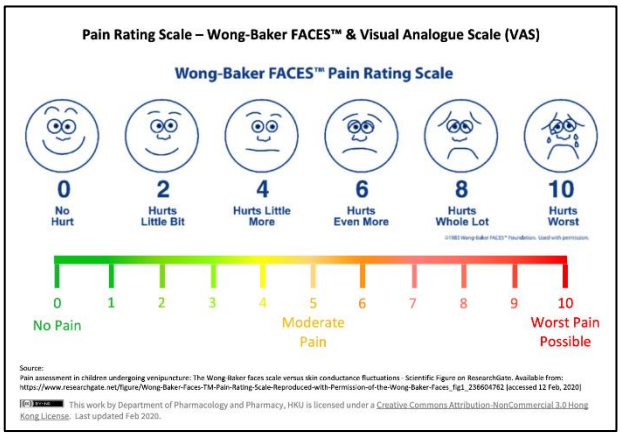

Figure 1: Visual analogue scale.

Dilatation and curettage: After thorough preoperative evaluation, investigations and taking fitness for anaesthesia, patients were posted for diagnostic

hysteroscopy followed by curettage. All of them were subjected to IV. sedation with pentazocine and midazolam general anaesthesia (ketamine or propofol) was given in whom paracervical block i.v sedation was inadequate. Speculum and bimanual examination were done to confirm the findings. In this procedure, Sim's speculum was inserted, and the anterior lip of the cervix was held using a vulsellum. Cervical dilatation was performed, when necessary, with Hegar's dilator. Continuous flow hysteroscopy was conducted using a 6.2mm diagnostic sheath and a 30-degree Karl Storz telescope, with xenon light and a CCD camera. Normal saline served as the distending medium with controlled pressure. The endocervical canal, uterine cavity, and ostia were inspected, findings noted, and uterine cavity curettage was performed. Specimens were sent for histopathological examination. A second-look hysteroscopy ensured complete removal of abnormalities. Patients were discharged on the same or following day and followed up with histopathology reports for further management.

Statistical analysis

The data collected was analysed using SPSS version 20.0 Socio-demographic variables were analysed in terms of mean, standard deviation (SD), frequency (n) and percentage (%). A p value of <0.05 was taken as statistically significant. Data results were represented in the form of tables and figures.

RESULTS

In this study 100 patients were included. The mean age of the study participants 41.7±8.32 years. Among participants 83 (83%) belonged to 40-45 years age group, rest of them were in their third decade of life. It was observed that 83% patients were multipara, 15% were primipara, 2% were nulligravida. The contraceptive profile revealed that 68 % had undergone tubal ligation, 1% was using OC pills as contraceptive method and barrier methods were used by 8% of patients. Other demographic characteristics are summarised in table 1.

We found menorrhagia in 43% patients followed by polymenorrhagia in 37% patients (Figure 2).

Examinations findings

On speculum examination, 23% of them had abnormal findings while 77% had healthy cervix. On vaginal examination majority of patients had normal sized uterus (62%). On pap smear 16% had inflammation. The findings are summarized in table 2.

On hysteroscopy 58% cases had normal findings and 42% of cases had abnormal findings (Figure 3) and the histological findings are summarised in table 3.

Table 1: Demographic and other variables of the participants (n=100).

Variables	Values
Age (Mean±SD) (in years)	41.7±8.32
Age group categorisation in years	**N (%)**
25-30	0 (0)
31-35	4 (4)
36-40	13 (13)
41-45	83 (83)
Parity	
Nulligravida	2 (2)
Primipara	15 (15)
Multipara	83 (83)
Types of contraceptives used	
Tubal ligation	68 (68)
Barrier method	8 (8)
OCPs	1 (1)
Nil	23 (23)
Comorbidities	
Hypertension	22 (22)
Diabetes mellitus	11 (11)
Hypothyroidism	8 (8)
Other comorbidities	11 (11)
Nil	48 (48)

*OCP - Oral contraceptive pills, SD - Standard deviation

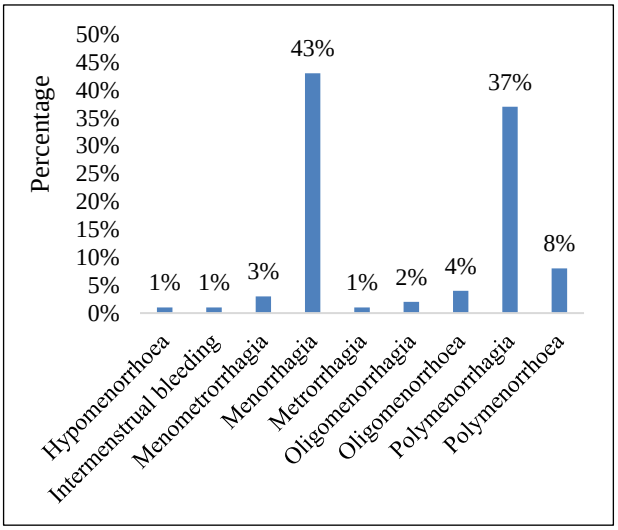

Figure 2: Patients menstrual complaints distribution.

Diagnostic accuracy

Sensitivity, specificity, positive predictive value, negative predictive value of pipelle for diagnosing atrophic endometrium, secretory phase endometrium, simple endometrial hyperplasia is 100%. Whereas the sensitivity, specificity, positive predictive value and negative predictive value for proliferative phase endometrium comes to 99% when compared with that of D&C.

Table 2: Examination findings of the patients (n=100).

Findings	Values N (%)
Cervical speculum findings	
Erosion/ Ectropion	12 (12)
Hypertrophied	8 (8)
Polyp seen at ectocervix	3 (3)
Healthy	77 (77)
Vaginal examination findings	
10-12 weeks	2 (2)
8-10 weeks	7 (7)
6-8 weeks	9 (9)
Bulky	20 (20)
Normal	62 (62)
Pap smear	
Inflammatory	16 (16)
Healthy	84 (84)

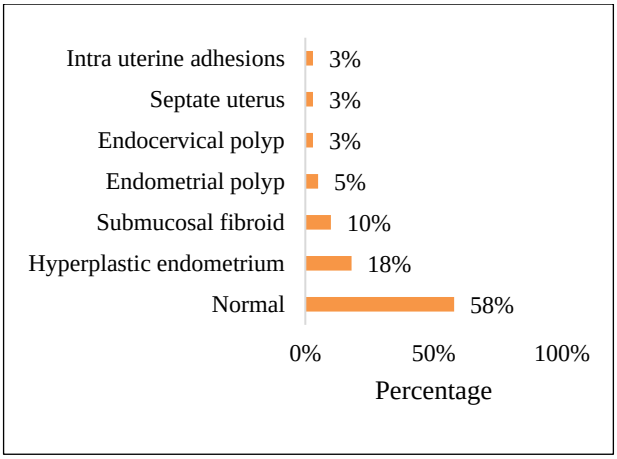

Figure 3: Hysteroscopic findings of patients.

Table 3: Histological findings of the patients (n=100).

Variables	HPR in endometrial biopsy	HPR in D&C
	N (%)	N (%)
Atrophic endometrium	2 (2)	2 (2)
Proliferative phase	52 (52)	53 (53)
Proliferative phase with dilation	5 (5)	5 (5)
Secretory phase	15 (15)	15 (15)
Simple endometrial hyperplasia	25 (25)	25 (25)
Complex glandular hyperplasia	0 (0)	0 (0)
Endometrial carcinoma	0 (0)	0 (0)
Inadequate sample	1 (1)	0 (0)
Total	100 (100)	100 (100)

*D&C-Dilatation and curettage

DISCUSSION

Endometrial sampling is considered the gold standard method for assessing Abnormal uterine bleeding (AUB). The primary objective of this study was to assess the diagnostic accuracy of office based endometrial biopsy using Pipelle method when compared with subsequent findings of Dilatation and Curettage (D&C) which is an inpatient procedure and to make a comparative analysis between these two approaches.

In my study, 100 patients with age group of 25 to 45 years with one or more episodes of abnormal uterine bleeding were included. A complete history and gynaecological examination were done and provisional diagnosis was made. USG findings, hysteroscopic findings and histopathological reports of EB and D&C were correlated and patients were treated keeping D&C histopathology findings as gold standard with due consideration of hysteroscopic findings.

In my study 17% of patients were in third decade of life while 83% of patients were above 40 years of age. There were hardly any patients in age group of 25-30 yrs.

The patients in my study presented with menorrhagia in 43% patients followed by polymenorrhagia in 37% patients and menometrorrhagia in 3%, intermenstrual bleeding in 1%. In a study by Srivastava et al, 2005, most common symptoms in patients with abnormal uterine bleeding were menorrhagia (40%), metrorrhagia (18%), menometrorrhagia (14%), and polymenorrhea (14%).[16] In similar study by Singh et al, 2001, the distribution of cases polymenorrhagia 12%, polymenorrhea 40%, menorrhagia 24%, irregular bleeding 20%, oligomenorrhoea 4%.[17] Analysing the contraceptive practices in my study group, 68% had undergone tubal ligation. 23% were not using any contraceptives. In a study of Acharya et al, 64% had tubal sterilization, 4% were using OC pills, 10% IUCD & 2% barrier methods.[18]

In my study, on hysteroscopy 58% cases had normal findings and 42% cases showed abnormal findings. We found most common finding on hysteroscopy was hyperplastic endometrium 18%, endocervical polyp 3%, Endometrial polyp 5%, submucosal fibroid 10%, intra uterine adhesions/synechia 1%, atrophic endometrium 2%, septate uterus 3%. A systemic review and meta-analysis by van Dongen et al in 2007 showed that diagnostic hysteroscopy is both accurate and feasible in the diagnosis of intrauterine abnormalities which was 46.6% in cases

with AUB.[19] Gimpelson and Rappold reported that hysteroscopy combined with guided biopsy was more accurate than D & C; hysteroscopy is considered an accurate (gold standard) in uterine cavity evaluation. In 141 patients studied, they found the D & C alone was less revealing in 30 of them (21%).[20] Englund et al found 33 polyps by hysteroscopy, 11 of which had been missed with D & C.[21]

In my study, on histopathological examination, majority of patients had Proliferative phase endometrium (53%), and secretory phase endometrium in 15 % cases. 5% showed Proliferative phase with cystic dilation, 2% showed atrophic endometrium. Simple endometrial hyperplasia was seen in 25% cases without atypia. In a study conducted by Ozdemir et al, the main objective was to determine the optimal cutoff value for endometrial thickness using transvaginal ultrasonography (TVS) and to assess the accuracy of preoperative Pipelle biopsy in premenopausal women presenting with abnormal vaginal bleeding.[22] The study included a total of 144 women. Among these participants, 113 (78.4%) had a normal endometrium, while 31 (21.6%) had an abnormal endometrial appearance. Within the group with an abnormal endometrium, 11.8% of cases were found to have hyperplasia.

In my study, the diagnostic accuracy endometrial sampling with pipelle and conventional D & C for histopathological examination was compared. Sensitivity, specificity, and positive predictive value of pipelle for diagnosing atrophic endometrium, secretory phase endometrium, and simple endometrial hyperplasia is 100%. Whereas the Sensitivity, specificity and positive predictive value for Proliferative phase endometrium comes to 99% when compared with that of D & C (considering D & C as gold standard). In the research conducted by Fakhar S. and colleagues, they found that Pipelle demonstrated excellent performance with a sensitivity, specificity, positive predictive value, and negative predictive value of 100%.[15] For the diagnosis of hyperplasia with atypia, Pipelle also exhibited strong diagnostic capabilities, with 100% sensitivity, 98% specificity. In a study conducted by Demirkiran et al in 2012, the researchers compared the histological results of two different diagnostic procedures ie pipelle biopsy and dilatation and curettage (D&C).[10] The study suggests that there is moderate agreement between the histological results obtained from pipelle biopsy and D&C. Sensitivity rates varied for the detection of hyperplasia and atypia, with D&C showing higher sensitivity for atypia but lower sensitivity for hyperplasia compared to pipelle biopsy. These findings provide valuable insights into the diagnostic accuracy of these procedures for assessing endometrial pathology.

In my study, I got adequate sample in 100% of cases of D & C whereas with pipelle, one sample was inadequate (ie in 99% cases, it was adequate). In the study by Fakhar et al, adequate sample was obtained in 98% of cases by pipelle and in 100% of cases by D&C.[15] whereas Kazandi et al found insufficient material in six cases (7%) with Pipelle biopsies and three cases (4%) with D&C.[23]

In my study, the diagnosis of endometrial polyp was missed in both EB and D & C group when hysteroscopy had diagnosed 3 cases of endocervical polyp and 5 cases of endometrial polyps. In the study by Kazandi et al, it was observed that only 1 of 13 cases of endometrial polyps was diagnosed with Pipelle biopsy.[23] While Pipelle biopsies and D&C have a nearly equal level of success in widespread endometrial lesions, Pipelle biopsies provide limited diagnostic accuracy in cases with focal pathologies. The study by Demirkiran et al concluded that neither pipelle nor D&C is adequate method for focal endometrial pathologies.[10]

In my study, the pain experienced using pipelle and D & C for endometrial sampling was compared. Patient-reported pain was measured by a 1-10 visual analog scale while performing pipelle aspiration as office procedure without any anaesthesia and that with D & C under anaesthesia. I observed, the maximum pain experienced with pipelle aspiration was upto the score of 4, which is suggestive of mild discomfort or pain. The pain experienced during D & C was very much dependant on level of anaesthesia given. With best of anaesthesia, patients experienced nil pain. Leclair et al, compared pain experienced using two different methods of endometrial biopsy, either Pipelle or Explora curette, a randomized controlled trial.[24]

Office endometrial biopsies can be performed using different instruments. Traditionally, the Novac curette has been the standard choice for many years. However, newer silastic curettes have been created as an alternative due to the discomfort associated with the Novac curette. Personally, I have employed a suction endometrial sampling pipelle instrument with an outer diameter of 3.1 mm, and it does not necessitate the use of a pump or syringe.

In D & C procedure we need preoperative investigations like basic blood investigation, chest X ray, ECG, hospital stay charges for at least 1 day, cost for pre anesthetic and anesthesia medications. Considering all these basic expenses, the total cost for D & C is almost 10 times higher than the cost required for office based endometrial biopsy.

However, since the Pipelle biopsy is a cheap, simple to handle, safe, well tolerated, and a reliable office or outpatient tool, we recommend that be the initial diagnostic method in the evaluation of AUB, except for in patients with ultrasound scan results showing focal lesions such as endometrial polyps being the limiting factor. The more expensive procedures in the operating room should be reserved for selected patients who are not good candidates for Pipelle.

The endometrial sampling approach should not be the same for all patients with abnormal uterine bleeding. Each case should be assessed individually, and decisions related

to sampling procedures and devices should be personalized and customized, considering all of the factors influencing both the success and reliability rate.

CONCLUSION

This study concluded that utilizing a suction curette device like pipelle for endometrial sampling is a cost-effective and safe procedure that can be conveniently conducted in an outpatient setting. This approach seems to be a viable alternative to more invasive procedures like dilation and curettage (D&C) when assessing patients with abnormal uterine bleeding who are in their reproductive or premenopausal years. The endometrial samples obtained through this method are sufficient for histological examination and exhibit well-preserved tissue structure. Nevertheless, it is important to note that a negative histological result does not completely rule out the possibility of disease, and patients with persistent symptoms should undergo further evaluation through alternative diagnostic methods.

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