Pipelle Endometrial vs Hysteroscopic Endometrial Sampling in Abnormal Uterine Bleeding

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Abstract

Background: For Endometrial biopsy Pipelle sampling can be done as an office procedure. In this study Pipelle is being studied in terms of specificity and sensitivity for diagnosis and for replacing other methods of sampling.

Methods: 60 patients underwent pipelle endometrial sampling on OPD basis followed by hysteroscopic evaluation and endometrial sampling in the same menstrual cycle . Histopathology report of both the pipelle and hysteroscopic endometrial samples were compared and statistical analysis done.

Results: In subjects with proliferative Endometrium in Hysteroscopy 93.9% were diagnosed by pipelle sample, In Secretory Endometrium in Hysteroscopy, 83.3% were diagnosed by pipelle sample, Out of 33 subjects with Disordered Endometrium in Hysteroscopy, 100% were diagnosed by pipelle sample. In the sample Hyperplasia in hysteroscopy, 100% were diagnosed by pipelle sample. In samples without simple Hyperplasia in Hysteroscopy, 98.3% were negative in pipelle sample and 1.7% were positive in pipelle sample (False Positive). In Adenomatous Polyp in Hysteroscopy 20% were diagnosed by pipelle sample and 80% were negative (False Negative). In Cystoglandular Hyperplasia in Hysteroscopy, 100% diagnosed by pipelle sample.

Conclusion: Pipelle is 100% sensitive in diagnosing premalignant changes in the endometrium. Hence pipelle, a cost effective non-invasive procedure, can be used as a first line method to diagnose endometrial pathology in abnormal uterine bleeding.

Keywords: Abnormal uterine bleeding; Hysteroscopic endometrial sampling; pipelle endometrial sampling.

Introduction

Abnormal uterine bleeding is one of the common debilitating menstrual disorder that affects the women. A study based on epidemiology of menstrual disorders revealed that the prevalence of Abnormal uterine bleeding in developing countries was about five to fifteen%. Abnormal uterine bleeding in excessive, irregular bleeding usually associated either with hormonal disturbance or intrauterine pathology. Abnormal uterine bleeding was defined by FIGO as bleeding from uterine corpus that is abnormal, in volume regularity and/or timing that has been present for the majority of last six months. Abnormal uterine bleeding may present with variable pattern. Menorrhagia the most common (47%) followed by post-menopausal bleeding (27.9%), menometrorrhagia (15.3%) and metrorrhagia (8.8%). Juhi et al found that menorrhagia was the most prominent (57.4%) presenting symptom followed by Postmenopausal bleeding (17.9%), metrorrhagia (10.3%), polymenorrhagia (9.7%) and menometrorrhagia (4.6%). Leiomyoma and ovarian cyst were more common in reproductive age group. More than half of women in reproductive age group suffer from anemia and their mean hemoglobin concentration was 9.5 g/dl.

Classification

Method of classification used in Abnormal uterine bleeding which is used in recent times is PALM

– COEIN. There are nine main categories, which are arranged according to the acronym, PALM – COEIN: P- Polyp, A-Adenomyosis, L-Leiomyoma, M-Malignancy, C-Coagulopathy, O-Ovulatory dysfunction, E-Endometrial hyperplasia, I-Iatrogenic , N-Not yet classified. The components of PALM group are discrete (structural) entities that can be measured visually with imaging techniques and/or histopathology whereas the COEIN is related to entities that are not defined by imaging or histopathology (non-structural).
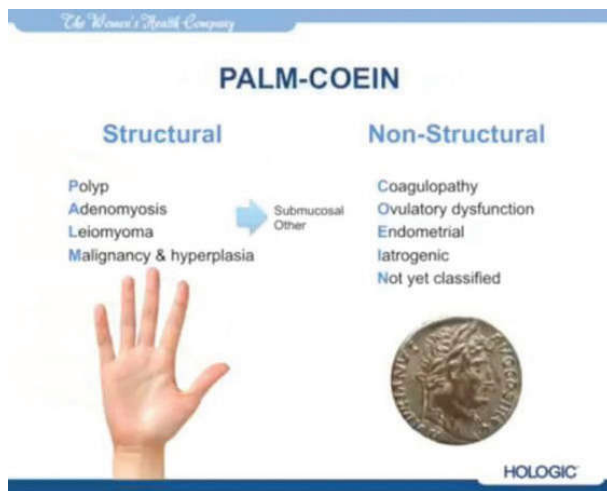

Fig. 1: Abnormal uterine bleeding classification (Shaw textbook of gynaecology).

Although most ovulatory disorders elude a defined etiology, many can be traced to endocrinopathies (e.g. polycystic ovarian syndrome, hypothyroidism, hyper-prolactinemia, mental stress, obesity, anorexia, weight loss, or extreme exercise such as that associated with elite athletic training). In some instances, the disorder may be iatrogenic caused by gonadal steroids or drugs that impact dopamine metabolism, such as phenothiazines and tricyclic antidepressants. It is also well recognized that otherwise-unexplained ovulatory disorders frequently occur at the extremes of reproductive age, adolescence and the menopause transition.

This study is to evaluate the efficacy of endometrial sampling by pipelle curette in abnormal uterine bleeding and also to compare efficacy of conventional hysteroscopic endometrial sampling with that of pipelle endometrial sampling in abnormal uterine bleeding patients.

Material and Methods

This is a prospective study done in the Gynaecology department, Vinayaka Mission Medical College and hospital, Karaikal, after getting approval from the Ethical Committee. Sixty patients of abnormal uterine bleeding, who were subjected to endometrial sampling followed by hysteroscopic sampling were included in this study. Inclusion Criteria: Women in the age group of 30–45 years with complaints of abnormal uterine bleeding were included in this study. Exclusion Criteria: Patients with Bleeding disorders, Thyroid disorder, Hyper-prolactinemia, Carcinoma of cervix and women on hormone replacement therapy were excluded.

After explaining about the study, informed written consent was taken from all the study individuals, which was explained in their vernacular language which was approved by ethical committee of the institution.

Data Analysis: P Value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests. Statistical Software: Microsoft Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyse data.

Results

In the study, majority (51.7%) of patients were in the age group >40 years. In the study majority of subjects had parity status of P2L2 (36.7%).

Table 1: Diagnosis Among Patients.

		Count	%
Diagnosis	Abnormal Uterine Bleeding	23	38.3
	Adenomyosis	15	25.0
	Fibroid Uterus	8	13.3
	Endometrial Hyperplasia	5	8.3
	Endometrial Polyp	3	5.0
	Leiomyoma	2	3.3
	Dysfunctional uterine bleeding	1	1.7
	Poly cystic ovarian syndrome	1	1.7
	Primary Infertility	1	1.7
	Seedling Leiomyoma	1	1.7

In the study out of 33 subjects with proliferative Endometrium Hysteroscopy, 93.9% were diagnosed by Pipelle Sample, 6.1% were negative (False negative). Out of 27 subjects without proliferative Endometrium in Hysteroscopy, 92.6% were negative in Pipelle Sample and 7.4% were positive in Pipelle sample (False Positive). There was significant association between Histopathology of Pipelle Sample and Histopathology of Hysteroscopy. (Tabel 2)

Out of six Subjects with Secretory Endometrium in Hysteroscopy, 83.3% were diagnosed by pipelle

Table 2: Comparison of Pipelle Sample diagnosis with respect to Histopathology of Hysteroscopy sample.

Pipelle Sample		Histopathology Of Hysteroscopy			
		Yes (%)	No(%)	X^2	df, P
Proliferative endometrium	Yes	32(93.9)	2(7.4)	44.92	df=1
	No	2(6.1)	25(92.6)		P<0.001
Secretory endometrium	Yes	5(83.3)	0(0.0)	49.091	df=1
	No	1(16.7)	54(100)		P<0.001
Disordered endometrium	Yes	5(100)	2(3.6)	41.29	df=1
	No	0(0.0)	53(96.4)		P<0.004
Simple hyperplasia	Yes	2(100)	1(1.7)	39.31	df=1
	No	0(0.0)	57(98.3)		P<0.001
Adenomatous polyp	Yes	1(20.0)	0(0.0)	11.8	df=1
	No	4(80.0)	55(100)		P<0.001
Cystoglandular hyperplasia	Yes	4(100)	1(1.8)	47.14	df=1
	No	0(0.0)	55(98.2)		P<0.001
Cystic endometrial hyperplasia with atypia	Yes	1(100)	0(0.0)	60	df=1
	No	0(0.0)	59(100)		P<0.001
Complex hyperplasia without atypia	Yes	1(100)	0(0.0)	60	df=1
	No	0(0.0)	59(100)		P<0.001

Table 3: Validity Of Pipelle Sample.

		Parameter					
		Sensitivity (%)	Specificity (%)	Ppv (%)	Npv (%)	Diagnostic Accuracy	Cohens'sKappa (Unweighted)
1	Proliferative endometrium	93.94	92.59	93.94	92.59	93.33	0.8653
2	Secretory endometrium	83.33	100	100	98.81	98.33	0.9
3	Disordered endometrium	100	96.36	71.43	100	96.67	0.8154
4	Simple hyperplasia	100	98.28	66.27	100	98.33	0.7917
5	Adenomatous polyp	20	100	100	93.22	93.33	0.3143
6	Cystoglandular hyperplasia	100	98.21	80	100	98.33	0.88
7	Cystic endometrial hyperplasia without atypia	100	100	100	100	100	1
8	Cytic endometrial hyperplasia with atypia	100	100	100	100	100	1

Sample, 16.7% were negative (false negative). Out of 54 subjects without secretory endometrium in Hysteroscopy, 100% were negative in pipelle sample, There was In the Study out of five Subjects with Cystoglandular Hyperplasia in Hysteroscopy, 100% were diagnosed by Pipelle Sample. Out of 56 Subjects without Cystoglandular hyperplasaia in Hysteroscopy, 98.2% were negative and 1.8% was positive in Pipelle Sample. There was significant association between Histopathology of Pipelle Sample and Histopathology of Hysteroscopy.

Out of 33 subject with Disordered Endometrium in Hysteroscopy, 100% were diagnosed by Pipelle Sample. Out of 55 Subject without Disordered Endometrium in Hysteroscopy, 96.4% were negative in Pipelle Sample and 3.6% were positive in Pipelle sample (False Positive). There was significant association between Histopathology of Pipelle sample and Histopathology of Hysteroscopy.

Out of two subjects with simple Hyperplasia

in Hysteroscopy, 100% were diagnosed by pipelle sample. Out of 58 subjects without simple Hyperplasia in Hysteroscopy, 98.3% were negative in pipelle sample and 1.7% were positive in pipelle sample (False positive). There was significant association between Histopathology of Pipelle sample and Histopathology of Hysteroscopy.

Out of five subjects with Adenomatous polyp in Hysteroscopy, 20% were diagnosed by pipelle sample and 80% were negative (false negative). Out of 55 Subjects without adenomatous polyp in Hysteroscopy, 100% were negative in Pipelle sample. There was significant association between Histopathology of Pipelle Sample and Histopathology of Hysteroscopy.

Among study population, one Subject with Cystic endometrial Hyperplasia in Hysteroscopy, 100% were diagnosed by Pipelle sample. Rest of all 59 Subject without Cystic endometrial Hyperplasia in Hysteroscopy, 100% were negative. There was

significant association between Histopathology of Pipelle Sample and Histopathology of Hysteroscopy.

Among study population one Subject with Complex Hyperplasia with atypia in Hysteroscopy, 100% were diagnosed by Pipelle sample. Rest of all 59 Subjects without Complex Hyperplasia with atypia in Hysteroscopy, 100% were negative. There was significant association between Histopathology of Pipelle Sample and Histopathology of Hysteroscopy.

Kappa agreement between Pipelle sample and Histopathology of Hysteroscopy sample in diagnosis of proliferative Endometrium was 0.865 (Almost perfect agreement).

Kappa agreement between Pipelle Sample and Histopathology of Hysteroscopy sample in diagnosis of secretory Endometrium was 0.9 (Almost perfect agreement)

Kappa agreement between Pipelle Sample and Histopathology of Hysteroscopy sample in diagnosis of Disordered Endometrium was 0.8154 (Almost perfect agreement).

Kappa agreement between Pipelle Sample and Histopathology of Hysteroscopy Sample in diagnosis of Simple Hyperplasia was 0.7917 (Substantial agreement).

Kappa Agreement between Pipelle Sample and Histopathology of Hysteroscopy sample in diagnosis of Adenomatous Polyp was 0.3143 (poor agreement).

Kappa Agreement between Pipelle Sample and Histopathology of Hysteroscopy sample in diagnosis of Cystoglandular Hyperplasia was 0.88 (Almost perfect agreement).

Kappa agreement between Pipelle Sample and Histopathology of Hysteroscopy sample in diagnosis of Cystic endometrial Hyperplasia was one (Perfect agreement).

Kappa agreement between Pipelle Sample and Histopathology of Hysteroscopy sample in diagnosis of Complex Hyperplasia with Atypia was one (Perfect agreement). (Table 3)

Discussion

- Abnormal uterine bleeding is one of the most common and challenging problems presenting as an enigma to the gynaecologist regardless of the age of the women.[1]

- Malignant and premalignant conditions may result in abnormal uterine bleeding, hence histopathological evaluation of endometrium plays a significant and pivotal role in the diagnosis and management of endometrial causes of abnormal uterine bleeding.[2]

- The PALM – COEIN (polyp; adenomyosis; leiomyoma; malignancy a; coagulopathy; ovulatory dysfunction; endometrial hyperplasia; iatrogenic; and not yet classified) classification system of Abnormal uterine bleeding, has been approved by the International Federation of Gynaecology and Obstetrics (FIGO) Executive Board as a FIGO classification system.[3]

- Abnormal uterine bleeding is not associated with significant mortality and may be considered unimportant by some health care professionals. Many women with Abnormal uterine bleeding consult healthcare professionals in primary health care and Abnormal uterine bleeding is a common reason for referral to a specialist.[4]

- There are many office endometrial procedures, pipelle is one among them, it is an easy and safe method. But the sample is blind and therefore will miss a focal lesion. Hence hysteroscopic directed sampling is recommended in the situation of a focal lesion found on ultrasound.[5]

- In this study, sensitivity of pipelle in diagnosing proliferative endometrium is 93.9.%, secretory endometrium 83.33%, disordered endometrium 100 %, 100 % sensitivity in detection of simple and complex hyperplasia, sensitivity was only 20 % in detection of polyp.[6]

- Structural causes of Abnormal uterine bleeding contributed more to the cause of Abnormal uterine bleeding (30.4%). The PALM – COEIN classification system helps us in understanding the various etiological causes of Abnormal uterine bleeding, can be used by the clinicians per International Comparison.[7]

Mechado and colleagues reviewed 1535 reports of postmenopausal patients with abnormal uterine bleeding, to establish the accuracy of endometrial biopsy with cornier pipelle in the diagnosis of endometrial cancer and atypical endometrial hyperplasia. The cornier pipelle was 84.2% sensitive, 99.1% specific, 96.9% accurate, with 94.1% Positive predictive value and 93.7% Negative predictive

value for detection of endometrial carcinoma and atypical hyperplasia and they concluded that endometrial biopsy taken with the cornier pipelle is an accurate method for diagnosis of endometrial cancer and its precursor atypical hyperplasia.

- A meta- analysis to assess the accuracy of endometrial sampling devices in detection of endometrial carcinoma and atypical hyperplasia was done by Dijkhuijen et al. They concluded that the endometrial biopsy with the pipelle is superior to other endometrial techniques in detection of endometrial carcinoma and atypical hyperplasia in pre and postmenopausal women.[8]

- In this study, the adequacy of obtaining sample from pipelle is 95%, out of the 60 samples, three samples had inadequate specimen. This may be due to a thin endometrium or a focal endometrial thickening. The counterpart in hysteroscopic sample showed proliferative and secretory pattern.

- In the study by Abdelazim et al, the pipelle and Dilatation and curettage were compared and the authors reported 100% sufficient sample in conventional Dilatation and curettage and 97.7% for pipelle that is higher by both methods in comparison to our study. It may be due to different techniques and instruments and also pathologist's experience.[9]

- In a study by Kazandi and colleagues the endometrial sample sufficiency rates were 91.6% and 98.3% by pipelle and Dilatation and curettage respectively.[10]

- A significant number of cases showed disordered proliferative pattern in this study. Disordered proliferative pattern lies at one end of the spectrum of proliferative lesions of the endometrium that includes carcinoma at the other end with intervening stages of hyperplasia. The term ''disordered proliferative endometrium'' has been used in a number of ways and is somewhat difficult to define. It denotes an endometrial appearance that is hyperplastic but without an increase in endometrial volume. It also refers to a proliferative phase endometrium that does not seem appropriate for any one time in the menstrual cycle, but is not abnormal enough to be considered hyperplastic. Disordered proliferative pattern resembles a simple hyperplasia, but the process is focal rather than diffuse. A higher incidence of disordered proliferative pattern was found in our study

as compared to Saraswathi Doraiswami et al.[11]

- In this study, out of five subjects with adenomatous polyp in hysteroscopy, 20% were diagnosed by pipelle sample, 80% where negative (false negative). Hence pipelle is not recommended for patients who we are suspecting endometrial polyp, which is evident by ultrasound or pelvic examination.

- Hysteroscopy is a useful tool to visualise the inside of the uterus, and diagnose the pathology effectively. Hence hysteroscopy can be recommended for patients whose diagnosis is under suspicion. Hysteroscopy has an added advantage of taking biopsy from focal lesion and polypectomy.

- Allameh and Mohammadizadeh compared hysteroscopic findings with pathology reports in women with Abnormal uterine bleeding. In that study, detection of endometrial polyps with hysteroscopy had a sensitivity of 93%, a specificity of 100%, a positive predictive value of 100%, and a negative predictive value of 95.4%.

- But there are various complications associated with hysteroscopy which include risk of perforation, electrolyte imbalance due to in-evident use of distension medium, added risk of anaesthesia, hospital stay, etc.

- Pipelle on the other hand is an office procedure, safe and cost effective. There is no need for dilatation of cervix prior to the procedure. And the rate of patient discomfort is less, compared to other procedures.

  Hence pipelle can be used as a first line method to obtain endometrial sample. In case of inadequate sample or suspected polyp cases, other methods can be advised.[12]

Conclusions

Pipelle is 100% sensitive in diagnosing premalignant changes in the endometrium. Hence pipelle, a cost effective non-invasive procedure, can be used as a first line method to diagnose endometrial pathology in abnormal uterine bleeding.

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