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Role of Suction Pipelle in Diagnosis of Endometrial Lesions in Patients with Abnormal Uterine Bleeding

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ABSTRACT

Background: Abnormal uterine bleeding (AUB) is a major clinical problem among women in the reproductive, perimenopausal and postmenopausal age groups. It may have a significant impact on woman physical, social, emotional and material quality of life. Along with the direct impact on the woman and her family, there are significant costs to both economy and health service. The AUB in women aged 40 and older, especially in peri and post-menopausal age group requires exclusive assessment, to exclude atypical endometrial hyperplasia and carcinoma.

Objective: This study aimed to determine the efficacy of suction pipelle in diagnosis of endometrial lesions in cases of abnormal uterine bleeding. **Patients and Methods:** The current study was designed as cross-sectional study conducted in Zagazig University Maternity Hospitals, Al-Ahrar Teaching Hospital and the Department of Pathology, Zagazig University during the period from April 2018 to July 2019. The study was conducted on 92 patients presented with abnormal uterine bleeding. **Results:** The 2 methods were 100% matched in diagnosis of secretory endometrium, hormone-dependent endometrium, atypical hyperplasia and EEC grade 1. The pipelle succeeded to diagnose some cases of proliferative endometrial and simple hyperplasia, which were missed by D & C (18.5% and 17.4% by pipelle versus 16.3% and 13% by D & C respectively for proliferative endometrial hyperplasia and 8.7% and 17.4% by pipelle versus 16.3% and 19.6% by D&C for simple hyperplasia respectively). **Conclusion:** Pipelle had high sensitivity and specificity for diagnosis of proliferative endometrial, secretory endometrium, hormone-dependent endometrium, simple endometrial hyperplasia, atypical hyperplasia and EEC grade 1.

Keywords: Suction Pipelle, Endometrial lesions, Abnormal uterine bleeding.

INTRODUCTION

Abnormal uterine bleeding (AUB) is a significant clinical entity and it is one of the most common complaint among women in reproductive age attending to physicians. It may have a significant impact on woman physical, social, emotional and material quality of life. Along with the direct impact on the woman and her family, there are significant costs to both economy and health service **(1).**

AUB [formerly, dysfunctional uterine bleeding (DUB)] is irregular uterine bleeding that occurs in the absence of recognizable pelvic pathology, general medical disease, or pregnancy. It reflects a disruption in the normal cyclic pattern of ovulatory hormonal stimulation to the endometrial lining. The bleeding is unpredictable in many ways. It may be excessively heavy or light and may be prolonged, frequent, or random **(2).**

The International Federation of Gynecology and Obstetrics working group on menstrual disorders has recently developed a classification system for causes of the AUB in non-gravid women of reproductive age. There are nine main categories, which are arranged according to the acronym PALM-COEIN: Polyp; adenomyosis; leiomyoma; malignancy and hyperplasia; coagulopathy; ovulatory dysfunction; endometrial; iatrogenic; and not yet classified. Besides, systemic, iatrogenic or hormonal age-related causes and an endometrial pathology (polyps, submucous myomas endometrial hyperplasia, and endometrial carcinoma) should always be suspected, and evaluation appears to be mandatory **(3).**

There are numerous methods for endometrial assessment among women with abnormal uterine bleeding including ultrasonography, endometrial curettage D & C and office-based methods including biopsy by hysteroscopy or endometrial samplers such as pipelle. The main reason for performing endometrial biopsy in women with abnormal uterine bleeding is to confirm the benign nature of the problem, by ruling out endometrial carcinoma, so that medical treatment or conservative surgery can be offered, and unnecessary radical surgery can be avoided **(1).**

The endometrial curettage is gold standard method of endometrial sampling. However, it may lead to less than fifty percent. Curettage of endometrium in sixty percent of cases is also accompanied with risk of infection, and perforation. It also needs hospital admission and local or general anesthesia **(1).** While pipelle is an ambulatory, outpatient, cost-effective method, does not require a syringe or pump nor require general anesthesia or cervical dilatation and permits almost painless endometrial sampling **(4).**

The study aimed to determine the efficacy of suction pipelle in diagnosis of endometrial lesions in patients with abnormal uterine bleeding. So, presenting a

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suitable substitute for endometrial sampling techniques, which is simpler, cheaper, non-invasive, free of complications and offers good diagnostic accuracy.

PATIENTS AND METHODS

Sample size: 92 cases of abnormal uterine bleeding were included in this study. They were admitted to Zagzig University Hospital and Al-Ahrar Teaching Hospital during the period from 1st of April 2018 to end of July 2019.

Inclusion Criteria: Abnormal vaginal bleeding despite medical therapy. Endometrial thickness more than 12 mm in reproductive & premenopausal age group. Endometrial thickness more than 5 mm in postmenopausal age group.

Exclusion criteria: Possibility of pregnancy. Pregnancy-related problems like abortion and molar pregnancy. History of contraception. Patients with IUCD. Endometrial thickness < 4mm. Lower genital tract infection. Local gynecological cause. Patients with bleeding disorders (Coagulopathy, thrombo-cytopenia (less than 100000 platelet per mm^3). Patients on hormonal therapy. Use of anti-coagulants. Bleeding due to endocrinological disorders (thyroid diseases and diabetes) or due to liver or renal impairment.

Data Collection:

Via the computerized database, clinical examination and histopathological assessment. After institutional approval and informed patients' consent, 92 consecutive pre and postmenopausal women with abnormal uterine bleeding were included. Demographic and baseline data consisting of age, parity, pattern and amount of bleeding, contraception method and condition of pain (having or not having dysmenorrhea) were recorded for each patient.

For Endometrial sampling, each patient was transferred to the operating theatre. An endometrial sample by pipelle was taken without anesthesia or dilatation, and then samples were placed in the sampling container. Then, under general anesthesia, diagnostic dilatation and curettage was performed by sharp curette. The collected samples were placed in separate containers. Each container was identified by a unique label and sent to the pathologist. The pathologist who examined the samples was not aware of the method of sampling. After completion of the study, pathologist's reports were compared between the two methods.

All patients were subjected to the following:

History: Detailed history was taken from each patient including.

Examination:

1-General examination: Including blood pressure, pulse, temperature and respiratory rate.

2- Abdominal examination: Evaluation of fundal level. Presence of any scars of previous operations

3-Laboratory investigation: complete blood count, fasting blood glucose, pregnancy test (BHCG), coagulative tests, thyroid function tests, serum prolactin and liver and kidney function tests were performed.

4- Transvaginal ultrasonography: Evaluation of myometrium, endometrial thickness and uterine cavity.

5-Sample collection technique: The patients were transferred to operation room on the scheduled day of operation and after vaginal washing and speculum insertion in lithotomy position; the sampling was performed prior to anesthesia after dilatation and using of tenaculum. After insertion of the pipelle in the uterine cavity, the piston of the sheath was drowned back to make negative gradient and then the pipelle was removed slowly. If the sample was insufficient, the procedure was repeated once or twice more.

The samples were collected in container A. Then under general anesthesia, dilatation and curettage was performed by using the Sims curette number 3 or 4 and the samples were collected in container B. The samples were sent for histopathological evaluation by the same pathologist. The patients and pathologist were blinded about the sequence of sampling and the method of sample that was used for every sample.

Ethical Considerations:

Approval to conduct the study was obtained from the Research Committee, Faculty of Medicine, Zagzaig University. An informed verbal consent was obtained from every patient.

Statistical analysis

Data were coded, entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0) software for analysis. Qualitative data were represent as number and percentage and quantitative data were represent by mean ± SD. The following tests were used: difference and association of qualitative variable by Chi square test (X^2), differences between quantitative independent groups by t test and ROC curve was used. P value was set at ≤ 0.05 for significant results.

RESULTS

Table (1) and figure (1) showed that that the ages of the studied group ranged from 27 up to 66 years with a mean of 44.8 years old, parity of the studied group ranged from 0 to 5 times, 48.9% of them were obese and 31.5% were overweight.

Table (2) showed that the mean duration of bleeding ranged from 7 up to 90 days with a mean of 23.8 days, endometrial thickness of the studied group ranged from 6 to 15 mm, and 76.1% of them were pre-menopause.

Table (3) and figure (2) showed that the most common presented symptoms among the studied group were menorrhagia (42.4%), poly-menorrhagia (30.4%) and metrorrhagia (16.3%).

Table (4) showed that the sensitivity of pipelle sampling was 100% in detecting proliferative, secretory, hormonal-dependent endometrium, simple and atypical hyperplasia and EEC grade 1, while it was 89% for the detection of disordered endometrium and 53.3% only for detection of polyp. So, the pipelle sample being a simple technique can be used as a screening procedure for obtaining endometrial sample in the patients with abnormal uterine bleeding.

Table (1): General characteristics of the studied group

Variables	Cases N=92	
Age (years)		
Mean ± SD	44.8 ± 10.2	
Parity number		
Mean ± SD	1.8 ± 1.21	
Variables	**(N=92)**	**Percent %**
BMI (kg/m^2)		
Normal	18	19.6
Overweight	29	31.5
Obese	45	48.9

Figure (1): Body mass index presented among studied group

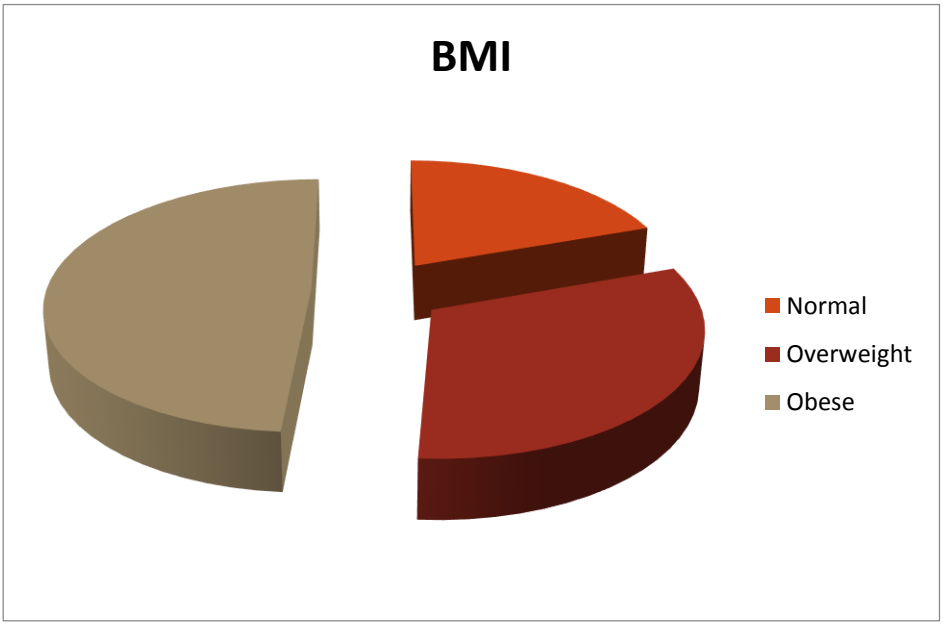

Table (2): Clinical data of the studied group

Variables	Cases N=92	
Duration of bleeding (days)		
Mean ± SD	23.8 ± 15.8	
Endometrial thickness (mm)		
Mean ± SD	11.2 ± 2.71	
Variables	**(N=92)**	**Percent %**
Menopausal status:		
Pre-menopause	70	76.1
Post-menopause	22	23.9

Table (3): Symptoms presented among the studied group

Symptoms	Cases N=92	
	N	**Percent %**
Menorrhagia	39	42.4
Poly-menorrhea	28	30.4
Metrorrhagia	15	16.3
Post-menopausal bleeding	10	10.9

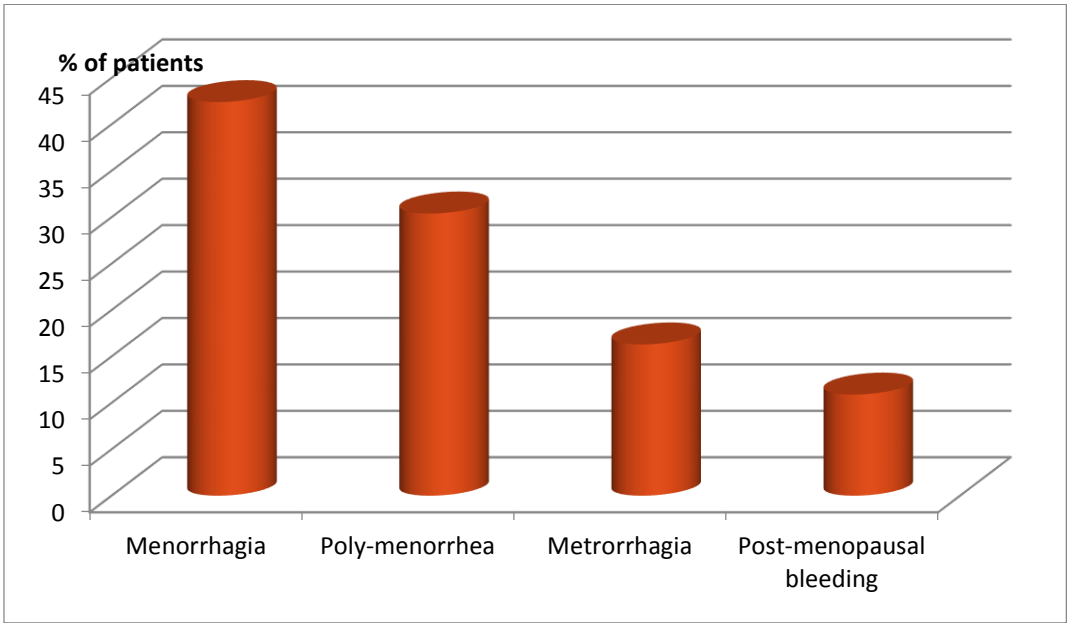

Figure (2): Symptoms presented among the studied group

Table (4): Reliability data of pipelle device results in comparison to D & C results

Type of disease	Pipelle device results N=92			
	Sensitivity	**Specificity**	**PVP**	**PVN**
Proliferative endometrium	100%	97%	88%	100%
Secretory endometrium	100%	100%	100%	100%
Endometrial polyp	53.3%	100%	100%	91.7%
Disordered proliferative endometrium	89%	100%	100%	97.4%
Hormone dependent endometrium	100%	100%	100%	100%
Simple endometrial hyperplasia	100%	95%	75%	95%
Atypical endometrial hyperplasia	100%	100%	100%	100%
EEC grade 1	100%	100%	100%	100%

DISCUSSION

In our study, we work on 92 cases who presented with abnormal uterine bleeding. From each case, we took two samples the first was by pipelle and the second was by standard dilation and curettage. Then the two samples are labelled A & B respectively then referred to a pathologist who was not aware about the method of sampling then the results of the two samples were compared.

Regarding the clinical features of the study population, age ranged from 27 up to 66 years with mean of 44.8 years. Their parity ranged from 1 to 5 with mean of 1.8. Regarding BMI, 18 cases (19.6%) were normal (18-25 Kg/m^2), 29 cases (31.5%) were overweight (25-30 kg/m^2) and rest of cases (45 case, 48.9%) were obese (more than 30 kg/m^2) from that it seems that most of patients were obese. This agrees with **Chandrakumari *et al.*** [5] study that was done on 210 patients in India from 2016 to 2017 as they showed that the age of the studied population ranged between 31 and 66 years with mean age of 44.6 years. In comparison with a study performed in Iran in 2013 By **Moradan et al.** [6] on 130 patients, similar results have been observed. The mean age of the study group was 46.19 years ranging from 37 to 57 years. The mean parity was 2.9 ranging from 1 to 5 times. BMI of cases: 13.8% of cases were normal weight, 83.1% were overweight, and 3.1% were obese. Our data also agree with data obtained from a study performed in Kuwait in 2013 by **Abdelazim *et al.*** [4] on 143 cases and showed that the mean age of the study group was 46.3 years ranging from 40 to 49 years. The mean parity was 4.7 ranging from 1 to 6 times.

Regarding to menopausal state of our studied group, most of cases were pre-menopause with percentage of 76.1%, the rest of cases were post-menopause. It was to somehow consistent with that in **Chandrakumari *et al.*** [5] study as the percentage of pre- menopause was 62.3%.

The most common presenting symptoms among our studied group was menorrhagia 39 cases (42.4%), 28 cases (30.4%) presented with poly-menorrhagia, 15 cases (16.3%) presented with metrorrhagia and finally 10 cases (10.9%) presented with Post-menopausal bleeding. Our results are consistent with **Abdelazim *et al.*** [4] where the presenting symptoms were menorrhagia 37%, poly-menorrhagia 25.8%, metrorrhagia 18.1% and Post-menopausal bleeding 16.7%.

In our study, tissues obtained for histopathology were mostly sufficient in both methods. Sample sufficiency was 97.9% for D & C as there were only 2 insufficient samples while in pipelle sampling, it was 94.6%, 5 samples are in insufficient. It nearly agrees to **Chandrakumari *et al.*** [5] study, as pipelle sample was found inadequate for evaluation in 10 cases. So, sufficiency rate was 95.2% while all the 210 D & C samples were adequate for histopathological examination, 100% sufficiency rate. Similar results have been observed in **Abdelazim *et al.*** [4] study where sample sufficiency was 100% for D & C versus 97.9% for pipelle. In addition, similar results are reported in a study by **Naderi *et al.*** [7] the sufficiency rates were 91.6% and 98.3% by pipelle and D & C respectively.

Regarding pathology of endometrial tissue obtained by D & C and pipelle, the current study showed that the pathological findings obtained by D & C revealed proliferative endometrium in 15 cases (16.3%), secretory endometrium in 14 cases (15.2%) and endometrial polyp in 15 cases (16.3%). In addition, there were disordered proliferative endometrium in 18 cases (19.6%), hormone-dependent endometrium in 9 cases (9.8%), simple endometrial hyperplasia in 12 cases (13%), atypical endometrial hyperplasia in 4 cases (4.3%) and EEC grade 1 in 3 cases (3.3%). While, pipelle revealed proliferative endometrium in 17 cases (18.5%), secretory endometrium in 14 cases (15.2%), Endometrial polyp in 8 cases (8.7%), Disordered proliferative endometrium in 16 cases (17.4%), hormone-dependent endometrium in 9 cases (9.8%), simple endometrial hyperplasia in 16 cases (17.4%), atypical endometrial hyperplasia in 4 cases (4.3%) and EEC grade 1 in 3 cases (3.3%). These results are in accordance with **Chandrakumari *et al.*** [5] who studied endometrial samples collected from 210 patients with AUB initially by pipelle method followed by D & C. Histopathological examination of endometrial samplings by D & C revealed that there were proliferative endometrium in 37 cases (17.6%), secretory endometrium in 25 cases (11.9%), disordered proliferative endometrium in 37 cases (17.6%), hormone dependent endometrium in 8 cases (3.8%), simple endometrial hyperplasia in 77 cases (36.7%), atypical endometrial hyperplasia in 6 cases (2.9%) and endometrial adenocarcinoma in 9 cases (4.3%). While, Pipelle method revealed that there were proliferative endometrium in 34 cases (16.2%), secretory endometrium in 25 cases (11.9%), disordered proliferative endometrium in 30 cases (14.3%), hormone-dependent endometrium in 5 cases (2.3%), simple endometrial hyperplasia in 85 cases (40.5%), atypical endometrial hyperplasia in 7 cases (3.3%), endometrial adenocarcinoma in 7 cases (3.3%). This gives impression that simple endometrial hyperplasia is the commonest cause of peri-menopausal bleeding [5].

Regarding validity, our study showed good agreement between pipelle and D & C in detection of endometrial abnormality. Pipelle had 100% sensitivity and 97% specificity in diagnosis of proliferative endometrium, 100% sensitivity and 100% specificity in diagnosis of secretory endometrium, 53.3% sensitivity and 97% specificity in diagnosis of endometrial polyps, 89% sensitivity and 100% specificity in diagnosis of disordered proliferative

endometrium, 100% sensitivity and 100% specificity in diagnosis of hormone-dependent endometrium, 100% sensitivity and 95% specificity in diagnosis of simple endometrial hyperplasia, 100% sensitivity and 100% specificity in diagnosis of atypical endometrial hyperplasia while, 100% sensitivity and 100% specificity in diagnosis of EEC grade 1. These results are in accordance with **Chandrakumari *et al.* [5].** There was significant positive correlation ($p < 0.01$) between the two techniques so according to this study endometrial sampling by pipelle method had a high sensitivity and negative predictive value in diagnosing abnormal endometrium **[5].** In support of our finding's validity of pipelle, **Alliratnam *et al.* [8]** found that pipelle had sensitivity and specificity in proliferative endometrium of 100% and 92% respectively, in secretory endometrium 100% and 100% respectively, in disordered proliferative endometrium 90% and 100% respectively, in adenocarcinoma 100% and 100% respectively and in endometrial polyp 16% and 100% respectively. Similar results are observed in **Moradan *et al.* [6]** study as where pipelle had sensitivity and specificity in proliferative endometrium of 94.4% and 100% respectively, in secretory endometrium 97.4% and 100% respectively, in simple endometrial hyperplasia without atypia 92.3% and 100% respectively, in endometrial cancer 100% and 100% respectively and in atrophic endometrium 50% and 100% respectively. Our results are also consistent with somehow with **Abdelazim *et al.* [4]** study results where pipelle showed sensitivity and specificity in proliferative endometrium of 100% and 100% respectively, in secretory endometrium 100% and 100% respectively, in endometrial hyperplasia 100% and 100% respectively, endometrial carcinoma 100% and 100% respectively and endometrial polyp 60% and 100% respectively.

CONCLUSION

Pipelle had high sensitivity and specificity for diagnosis of proliferative endometrial, secretory endometrium, hormone-dependent endometrium, simple endometrial hyperplasia, atypical hyperplasia and EEC grade 1.

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