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Correlation of Endometrial Biopsy by Pipelle and Vaginal Cytology in Assessing the Type of Dysfunctional Uterine Bleeding

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ABSTRACT

To assess efficacy of vaginal cytology in diagnosing the type of dysfunctional uterine bleeding by correlating it with endometrial histopathology by pipelle. Comparing endometrial sampling and vaginal cytology in dub there is no statistically significance difference between endometrial sampling and vaginal cytology with maturation index on dub type, it was confirmed using chi square test. However, the endometrial sampling is always superior to the vaginal cytology as it helps to know detailed histology of endometrium especially the hyperplasias, atypias, any premalignant conditions espescially in perimenopausal age group. Thus vaginal cytology cannot replace the endometrial biopsy.

Keywords: biopsy, andometrium, hyperplasias, atypias and genital tract infections

INTRODUCTION

The menstrual cycle is the regular natural changes that occurs in the uterus and ovaries that make pregnancy possible1.The uterine endometrium is under the influence of hormones. Cyclical uterine bleeding, which begins anatomically and physiologically normal female, marks an important stage of reproductive maturation5.'Dysfunctional Uterine Bleeding'(DUB) is coined to describe abnormal heavy menstrual bleeding when no structural genital tract abnormality or general cause was detected, in a women of reproductive age in the absence of pregnancy2.The diagnosis can be made by excluding all other causes such as systemic diseases, organic causes and pregnancy.

In patients with DUB 60% have normal endometrium, 30% have endometrial hyperplasia, 2 -22% have atrophic endometrium, 1.5-25% have luteal phase abnormalities3. Of these 80-90% of bleeding results from dysfunction of hypothalamic-pituitary-ovarian axis, which leads to anovulation4. It mainly presents as menorrhagia, hence, theterm generally refers to heavy, prolonged and frequent bleeding of

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uterine origin which is not due to any recognizable cause (Farrell, 2004). It is a debilitating disorder both medically and socially.3-5

The vaginal epithelium is responsive to sex steroids, particularly estrogen, and undergoes predictable changes through the cycle in response to changes in blood concentrations of ovarian hormones. The collective effect of estrogen (the "estrogen effect") in a woman's body can be estimated through evaluation of the squamous cell layer that lines the vagina in a test known as a maturation index. Hormonal cytology of the vagina is a reliable, inexpensive and simple semi-quantitativeoffice procedure for evaluating normal and abnormal ovarian function.In this study we compare the endometrial sampling by pipelle method from DUB patients and vaginal cytology from same patients i.e., 100 women attending the gynecological OPD in Sree Balaji Medical College Hospital and study the efficiency of vaginal cytology.6-9

MATERIALS AND METHODS

STUDY TYPE: prospectivestudy

SAMPLE SIZE: 100patients

PLACE OF STUDY: Subjects attending the Gynaecology OPD, Sree Balaji Medical College and Hospital, Chrompet.

Inclusion criteria:

All cases clinically diagnosed asDysfunctional Uterine Bleeding were included in the study, Those Women who are willing to participate in this study and Reproductive age group (20 yrs – 49 yrs).

EXCLUSION CRITERIA:

Cases with known organiccauses for Abnormal uterine bleeding., Any systemic diseases.Organic causes of abnormal uterine bleeding such as genital tract infections, iatrogenic causes, polyps.Pubertal DUB.

METHODOLOGY:

After getting the ethical committee approval, a Prospective study was conducted in the Department of OBG, in Sree Balaji Medical College and Hospital attending gynaec OPD. Subjects fulfilling the inclusion and exclusion criteria were recruited.

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STATISTICAL ANALYSIS:

Demographic variables in categorical were given in frequencies with their percentages. VAGINAL CYTOLOGY AND ENDOMETRIAL BIOPSY were given in frequencies with their percentages. Association between VAGINAL CYTOLOGY AND ENDOMETRIAL BIOPSY and Age wereanalysed using pearson chisquare test. Correlation between VAGINAL CYTOLOGY AND ENDOMETRIAL BIOPSY

was analysed using chi square test. Simple bar diagram, Multiple bar diagram were used to represent the data .P<0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Table 1: AGE DISTRIBUTION

Age group	No. ofwomen	%
21 - 25 years	2	2.0%
26 - 30 years	9	9.0%
31 - 35 years	11	11.0%
36 - 40years	36	36.0%
41 - 45years	34	34.0%
46 - 50 years	8	8.0%
Total	100	100.0%

Table : 1 shows the age wise distribution of DUB. The DUB is more common between 35 -45 years. Minimum age of occurrence of DUB in our study group is 22 year and maximum is 48 year.

Table 2: Endometrial sampling bypipelle

Endometrial type	No. ofwomen	%
Complex hyperplasia withatypia	2	2.0%
Complex hyperplasia withoutatypia	3	3.0%
Cystoglandular hypertrophy	28	28.0%
Disordered Proliferativeendometrium	3	3.0%
Inadequate	5	5.0%

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Proliferative endometrium	21	21.0%
secretary endometrium	20	20.0%
Simple hyperplasia withatypia	4	4.0%
Simple hyperplasia withoutatypia	14	14.0%
Total	100	100.0%

Table : 2 shows different types of endometrium among DUB patients. Among 100 patients, Cystoglandular hypertrophy is 28% followed by Proliferative endometrium 20% and Secretory endometrium 20%, Simple hyperplasia with atypia 4%, Simple hyperplasia without atypia 14%, Complex hyperplasia with atypia 2%, Complex hyperplasia without atypia 3%, Disorderly proliferative endometrium is 3%.

Table 3: COMPARING ENDOMETRIAL SAMPLING AND VAGINAL CYTOLOGY INDUB

DUB type	**Endometrial sampling**	**Vaginal cytology**	**Chi square test**
Ovulatory	20(20.0%)	23(23.0%)	$\chi 2=0.40$ p=0.81 not significant
Anovulatory	75(75.0%)	71(71.0%)	
Inadequate	5(5.0%)	6(6.0%)	
	100	100	

Table:3 There is no statistically significance difference between endometrial sampling and vaginal cytology with maturation index on dub type , it was confirmed using chi square test.

Table 4: Correlation between vaginal cytology and endometrialsampling

	Endometrial ssampling	

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Vaginal cyctology	Inadequate	Anovulatory	Ovulatory	Total
Inadequate	5 (83.3%)	1 (16.7%)	0	6
Anovulatory	0	71 (100.0%)	0	71
Ovulatory	0	3 (13.0%)	20 (87.0%)	23
Total	5	75	20	100

Table : 4 shows comparison of vaginal cytology with endometrial sampling in terms of type of DUB. In this study Kappa agreement coefficient is 0.90 and P value is0. 001 and hence a significant correlation. There is significant correlation between vaginal cytology and endometrial sampling.

Table 5: Correlation of vaginal cytology with endometrial sampling

	% of correlation for Ovulatory	% of correlation for Anovulatory	Total correlation
Present study	87%	100.0%	90%

Table: 5 shows the % correlation of vaginal cytology with endometrial sampling. Among 100 patients, especially in ovulatory DUB 87% correlation is seen between endometrial sampling and vaginal cytology. Among anovulatory type of DUB there were 100% correlation seen.

Menstrual disorders are a common indication for medical visits among women of reproductive age group 65 and heavy menstrual beeding affects upto 30% of women throughout their reproductive lifetime. Dysfunctional uterine bleeding continues to be one of the most frequently encountered and significant problem in gynecological practice 10.DUB may occur at any age from puberty to menopause and it may occur with any type of endometrium. Its etiology and management vary greatly in different groups. There are two different type of DUB namely, ovulatory and anovulatory and their management depends upon their type. We usually do endometrial sampling to identify the type of endometrium. Though pipelle is an office procedure and little invasive it has its own disadvantage. It is very difficult in previous cesarean section as they may have pinpoint os and it will be difficult to pass the pipelle instrument. It will be pain in

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some cases also. To overcomethis disadvantage in this study we tried whether the vaginal cytology can be used to identify the type of DUB.11-13

Vaginal cytology is a reliable, inexpensive, less invasive and simple semi quantitative office procedure for evaluating the type of endometrium as the vaginal mucosa is responsive to the hormonal levels. The estrogen uniquely stimulates full maturation of stratified epithelium of vagina while progesterone causes desquamation of epithelium and exposes the intermediate and parabasal cells. This plays an important role in the hormonal evaluation of various endocrine disorders. The contribution of the technique is maximized if there is an effective exchange of data between clinicians and cytopathologists, particularly as it pertains to the cytopathologic technique involved, the method of reporting the hormonal readings, and subsequent follow up management of the patient. Conditions that will render the test unsatisfactory, such as drying, cytolysis, and excessive inflammatory changes, will necessitate a repair smear. 14,15

Table 6: Comparing age group of this study with other study

Age group(years)	**Rajesh patil et al 2013**		**Present study**	
	N	**%**	**N**	**%**
21 – 30	39	20.53	11	11
31 – 40	86	45.26	47	47
41 – 50	49	25.79	42	42

In this study, DUB is more common among late reproductive age group(35 - 40 year) and perimenopausal age group(41 – 45 year) age group compared to early reproductive age group (58% vs 42%). This is similar to the study done by Kanakdugamba et al (1964), Nirmala AVK(1991), Pilli et al (2002), Mitra (2003), and Rajesh patil et al(2013).16-18

Table 7: Comparing parity of this study with other study

Parity	**Rajesh patil et al 2013**	**Present study**

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	N	%	N	%
Nullipaous	9	4.74	--	--
Primi	18	9.74	14	14
Multiparous	136	71.58	81	81
Grand multi	27	14.21	5	5

Among 100 DUB patients in our study, 23% had hyperplasia, 20% had proliferative endometr ium, 20% had secretory endometrium, 28% had cystoglandular hypertrophy, 3% had disorderely proliferative endometrium, 5% were inadequate. Among 23% of hyperplasia 3% were complex hyperplasia without atypia, were complex hyperplasia with atypia, 14% were simple hyperplasia without atypia, 4% were simple hyperplasia with atypia.Atypical hyperplasia of endometrium is common above 40 years of age while endometrial hyperplasia is more above 36 years of age. Cystoglandular hypertrophy is more in 36-45 years of age. Occurrence of disorderly proliferativeendometrium is above 36 years of age. While theproliferative type of endometrium is more among reproductive age group.

While comparing this study with Pilli et al (2002) showed 34% of them is proliferative endometrium 13% have secretory endometrium 2% in irregular shedding while in another study by rajesh patil et al (2013) had 22% in proliferative endometrium, 19.47% in secretory endometrium, 6.32% were irregular ripening, 32.63% were cystoglandular hypertrophy, 5.79% had hyperplasia,1.58% had atypical changes, 1.05% were adenocarcinoma. In this study proliferative endometium is 21%, secretory is 20%, cystoglandular hypertrophy is 28%, hyperplasia is 17%, atypical changes seen in 6%. 19

While correlating the endometrial sampling with vaginal cytology is shown in the Table: 9. Kappa agreement co-efficient is 0.90 and the P value is 0.001 and hence there is a significant correlation between endometrial biopsy and vaginal cytology. Percentage correlation of vaginal cytology and endometrial sampling is calculated and found to be 87% correlation in Ovulatory DUB and 100% correlation in anovulatory type of DUB.This can be compared in other studies done by Engineer AD et al 68 showed 91.11% correlation in ovulatory cycle and 87.5% correlation in anovulatory cycle between vaginal cytology and endometrial biopsy. Mehta 69 showed 90.9% correlation in ovulatory cycle and 100% correlation in anovulatory cycle between endometrial biopsy by pipelle and vaginal cytology. While another study done by Shanu etal70 showed 97.1% correlation for Ovulatory cycle and 100% correlation

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for anovulatory cycle between vaginal cytology and endometrial biopsy.20

Table 8: shows the % Correlation between endometrial biopsy by pipelle and vaginalcytology

Study	% correlation for ovulatory cycle	% correlation for anovulatory cycle	Total correlation %
Engineer AD et al[68]	91.11%	87.5%	94.3%
Mehta[69]	90.9%	100%	95.5%
Shanu et al [70]	97.1%	100%	98%
Present study	87%	100%	90%

Another study by Afroz N et al., role of vaginal hormonal cytology, endometrial biopsy and endocrinological evaluation in infertility. In his study, On the basis of cytological findings, of the 42 patients, 14 were found to be ovulatory, 26 anovulatory (which include 5 cases of atrophic changes) and 2 inconsistent due toinflammatory changes. Endometrial biopsy showed evidence of ovulation in 15, anovulation in 27 cases. Hormonal evaluation indicated some sort of endocrinological disorders in 15 patients, which may underlie anovulatory infertility in these patients, while results were within normal range in the rest 27 patients. Results of vaginal cytology and endometrial biopsy showed correlation in respect to ovulation in 93.33% of the cases.Another study by Bercovici B et al., 21 who studied the cytology of vaginal, cervical and endometrial smears obtained at the time of embryo transfer during in vitro fertilization' Of these, 68 vaginal, 46 cervical and 25 endometrial smears were available for cytologic examination. Of the 68 vaginal smears, 4% showed a proliferative pattern, 40% were early Secretory and 56% were advanced Secretory. The 46 cervical smears demonstrated a delayed hormonal effect, with 70% showing a Proliferative pattern, 23% early Secretory and 7% advanced Secretory cytology. Endometrial cells were obtained only when the Jones catheter, which has a sideopening, was used. Twenty-two

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patients had both vaginal.22

Above all studies show that vaginal cytology shows good correlation with endometrial studies and reflects the hormonal effect and is mainly useful in infertility evaluation for timing of ovulation. Thus by this study % correlation between endometrial biopsy and vaginal cytology is about 90% which approximately equal to the above mentioned study. 23 The endometrial sampling by pipelle may cause discomfort and it will be difficult to reach the endometrium in case of previous cesarean section. Thus doing vaginal cytology in these patients will definitely help in identifying the type of DUB which may help in the management of DUB. As the DUB is more common among perimenopausal age group and the hyperplasia is more common among perimenopausal age group. So doing vaginal cytology to assess the endometrium in these age group will determine only the hormonal status of the patient and the detailed endometrium cannot be identified. thus if any hyperplasia present will be missed in vaginal cytology. Though the vaginal cytology is simple,less invasive and less expensive, i t cannot replace the endometrial sampling by pipelle especially in perimenopausal age group. 24

CONCLUSION

DUB is more common among perimenopausal age group. This study was done to identify the reliability of simple, less invasive, painless procedure namely vaginal cytology which can be repeated easily to identify the type of DUB. There is a maximum correlation between vaginal cytology and endometrial sampling by pipelle in assessing the type of DUB. Vaginal cytology is equally helpful in assessing the type of DUB which may help in managing the patient efficiently. However the endometrial sampling is always superior to the vaginal cytology as it helps to know detailed histology of endometrium especially the hyperplasias, atypias, any premalignant conditions espescially in perimenopausal age group. Thus vaginal cytology cannot replace the endometrial biopsy.

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Ethical approval: The study was approved by theInstitutional Ethics Committee

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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