

# Correlation of Endometrial Thickness, Hysteroscopic Finding and Histopathological Diagnosis in Patients with Abnormal Uterine Bleeding.

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## ABSTRACT

**Background:** To correlate endometrium thickness(ET) measured by trans vaginal sonography (TVS) with their hysteroscopy finding along with histopathological diagnosis in patients of abnormal uterine bleeding. **Methods:** 120 patients of AUB in reproductive age group to post menopause were included in study. All were subjected for investigations including CBC,TSH,FBS and USG pelvis. Endometrial thickness was measured by TVS and were subjected for diagnostic Hysteroscopy(DH) . DH findings were noted as normal endometrium or abnormal findings . Endometrial curettage was performed in all patients and sample collected sent for histopathological study. **Result:** AUB was common in 41-50yrs age group and menorrhagia being the most common symptoms. The Prevalence of disease finding by DH ,its sensitivity and specificity were 46.6%,89.2% and 60.9% respectively. False positive rate and False Negative rate, positive predictivity ,negative predictivity, Calculated positive like hood ratio & negative likelihood ratio were 39%,10.7%,86.2%,2.2 and 5.6 respectively with Diagnostic accuracy was 74.1%. Hysteroscopic diagnosis of polyp has sensitivity & specificity of 100% who presented with post menopausal bleeding. Carcinoma endometrium was diagnosed in 3 patients (13%) out of 23 case of PMBPV. Maximum number of normal endometrium were observed when ET<15mm while polyp and Ca endometrium when ET was >15mm.But Ca endometrium was also diagnosed when ET was in range of 5-10mm.When ET was<5mm the endometrium pattern observed were either normal or atrophic. **Conclusion:** It is concluded from our study that in all AUB cases ET can impose an idea of case selection for Hysteroscopic procedure and D&C combined with hysteroscopy is the gold standard evaluation.

**Keywords:** TVS, hyperplasia, polyp, polypoidal, PMBPV.

## INTRODUCTION

Abnormal uterine bleeding(AUB) refers to uterine bleeding that is excessive or outside of normal cyclical pattern(frequency, quantity ,duration or schedule) which account for one third of gynaecologic outpatient visit and nearly two third of hysterectomies.<sup>[1,2]</sup> International Federation of Gynecology and Obstetrics(FIGO) in 2011 introduced the revised terminology PALM-COEIN (polyp, adenomyosis, leiomyoma, malignancy and hyperplasia, coagulopathy, ovulatory dysfunction, endometrial, iatrogenic,not yet classified).<sup>[3]</sup> Thorough history with pelvic examination followed by routine blood investigations (CBC,FBS,TSH) including USG can rule out uterine, ovarian and endocrine causes for AUB. But AUB causes related

to endometrium and endometrial cavity needs proper evaluation of cavity which helps treating physician to offer the most appropriate therapy.<sup>[4]</sup> The incidence of carcinoma endometrium is 6.96 per 1000women with postmenopausal bleeding.<sup>[5]</sup> Evaluation of endometrial cavity by blind sharp curettage alone can miss polyp as it covers 60% of cavity and also areas of focal malignancy.<sup>[6]</sup> Endometrial thickness and its morphology detection by TVUS is useful but it cannot exclude the malignancy or pedunculated or sessile endometrial lesions.<sup>[7]</sup> Whereas Hysteroscope provides a simple and easy methods for visualization of cervical canal and uterine cavity and also used for treatment of benign pathology in the same sitting. In this study, Our aim is to correlate all three procedures (TVUS, Hysteroscopy and Biopsy) in patients with symptoms of AUB.

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## MATERIALS AND METHODS

It is a prospective study conducted in O&G department of IMS & SUM Hospital under SOA

University Bhubaneswar during a period of one year. A total of 120 patients diagnosed to have symptoms of AUB attending o&g department were enrolled in study group. Patients enrolled were in reproductive age to postmenopausal age ranging from 30 to 70 years.

### **Inclusion Criteria**

Reproductive and postmenopausal age group patients with provisional clinical diagnosis of AUB were included in the study. Diagnosis was made by history taking with general examination followed by per speculum and per vaginal examinations. All these patients were subjected to routine investigations like CBC, TSH, FBS and USG pelvis (both TAS & TVS) to rule out any uterine, ovarian or endocrine causes for AUB as in PALM-COEIN classification. In all 120 patients ET were noted by TVUS and subjected for hysteroscopic evaluation of endometrial cavity after taking written consent from them. Hysteroscopy was performed by using KarlStorz hysteroscope based on a 2.9mm rod lens system with an outer diameter corresponding to 5mm. In Maximum number of patients were subjected for office hysteroscopy with cervical block or sedation where as anxious patients and expected difficult hysteroscopy examination were posted in routine operation theatre under anaesthesia. In all patients cavity evaluation features were documented as normal looking, hyperplastic endometrium or suspicious for carcinoma endometrium, presence of benign polyp or polypoidal growth, atrophic endometrium, presence of submucosal fibroid or fibroid polyp and retained product of conception (RPOC). Endometrial curettage was performed in all patients and sent for histopathological diagnosis. If DH finding was polyp, Polypectomy was done in same sitting.

### **Exclusion Criteria**

- Diagnosed case of pregnancy and pregnancy related complications
- Presence of vaginal and cervical infections
- Irregular intake of ocpill leading to AUB
- Suspected lower genital tract malignancy
- Presence of sexual transmitted disease
- Clinically palpable pelvic pathology

### **Description of endometrial patterns in hysteroscopic findings**

Normal looking endometrium- smooth flat or little elevated and pink in colour

Abnormal finding and (pathological endometrium)

Hyperplastic endometrium- smooth elevated, increased thickness of endometrium and pink in colour.

Polypoidal-multiple pale to pink look polypoid endometrial growth

Polyp- medium to large exophytic growth in endometrium may be sessile or pedunculated and pale to pink in colour.

Submucosal fibroid- it is firm and immobile covers with thin layer of endometrium usually lighter in color than surrounding endometrium.

Atrophic endometrium- Thin endometrial mucosa. Cavity looks smooth and transparent revealing the underlying vascular structure.

Endometrial Neoplasia- Irregular polypoidal growth with increase in vascularity along with features of necrosis.

## **RESULTS**

This study was conducted on 120 patients having symptoms of AUB. In all patients ET was measured by TVS. Hysteroscopy evaluation of endometrial cavity followed by curettage for endometrial sampling to study histopathological diagnosis was performed in each cases. Endometrial thickness and cavity evaluation findings of individual patients were correlated with their histopathological diagnosis.

Age distribution among patients of AUB varies from 30 to 70 years. The most common age group where maximum number of AUB patients were observed was 41 to 50 years (53%). The mean age group calculated was 50 with standard deviation (SD) 11.2 [Table 1]. Menorrhagia was the most commonest presenting symptoms 47 (39%) followed by metrorrhagia 40 (33%). 23 (19%) patients of AUB were having symptoms of postmenopausal bleeding pv [Table 2].

Hysteroscopy findings of all 120 AUB patients and their histopathological diagnosis was evaluated. Hysteroscopy findings were taken normal if it looks normal or atrophic endometrium and abnormal (disease) pattern if it was hyperplastic, polypoidal, benign polyp, RPOC, ca endometrium, submucosal fibroid as describe before. Similarly in histopathological diagnosis normal study includes secretary, nonsecretary, atrophic and bleeding endometrium or external hormonal effect. Abnormal histopathological finding includes complex hyperplasia, benign polyp, carcinoma endometrium, complex hyperplasia with polyp, endometritis, RPOC or submucosal fibroid [Table 3]

Out of 120 patients total data was as followed- Hysteroscopic finding is positive for disease finding in 75 patients and negative in 45 patients. similarly endometrial biopsy is positive disease finding in 56 patients and negative for 64 patients. Hence true positive (TP) in 50 cases, false positive (FN) in 25 cases and true negative (TN) in 39, false negative (FN) in 6 cases respectively. Result were subjected to Bayesian analysis. The prevalence (TP+FN/N) of disease endometrium in AUB is calculated to be 46.6% (N stands for total number of patients). Sensitivity (TP/TP+FN) and Specificity (TN/TN+FP) for disease finding in AUB by hysteroscopy are 89.2% and 60.9% respectively.

False positive rate and False Negative rate of hysteroscopy in AUB are calculated to be 39% and 10.7% respectively. Similarly positive predictivity is 57.1% and negative predictivity 86.6%. Calculated positive like hood ratio & negative like hood ratio were 2.2 and 5.6 respectively with Diagnostic accuracy of 74.1% [Table 4]. Maximum number of patients of AUB (46) were having ET within 5-10mm followed by 11-15mm & >20mm [Table 5].

**Table 1: Age Distribution total no of cases 120..**

Age	No. Of patients	%
30-35	13	10.83
36-40	15	12.50
41-45	31	25.8
46-50	33	27.5
51-55	16	13.3
56-60	6	5
61-65	3	2.5
66-70	3	2.5

**Table 2: Clinical Presentation.**

Clinical presentation	No. Of patients	%
Menorrhagia	47	39.16
Polymenorrhgia	10	8.3
Metrorrhgia	40	33.3
Post menopausal	23	19.16

**Table 3: Co-Relation of Hysteroscopic Finding With Histopathology Study of Endometrium**

Hysteroscopic finding	No. Of patient	Pathological finding	No. Of patients
Normal endometrium	33	Secretary	22
Hyperplastic endometrium	34	Non – secretary	29
Polypoidal endometrium	13	Complex hyperplasia	20
Benign polyp	20	Benign polyp	18
Rpoc	2	Rpoc	2
Atrophic endometrium	9	Atrophic endometrium	2
Ca endometrium	4	Ca endometrium	6
Polyp with complex hyperplasia	-	Polyp with complex hyperplasia	2
Endometraitis	-	Endometraitis	4
Submucousal fibroid with hyperplastic endometrium	3	Bleeding endometrium	4
Submucousal fibroid with nomral endometrium	2	External hormonal effect	11

Endometrial thickness and histopathological diagnosis were correlated. Normal endometrial pattern was observed when ET less than 15mm( 78% in ET 5-10mm & 54% when ET 11-15mm). Maximum cases of polyps were detected when ET is >16mm(27%). Carcinoma endometrium is detected more when ET>16-20mm. But ca endometrium was also reported even in ET 5-10mm and no cases in ET <5mm. Atrophic endometrium are more among ET < 5mm and hyperplastic endometrium among ET >15mm. 2 cases of RPOC are diagnosed in cases of

AUB having thickened ET >20mm [Table 6]. A total number of 23 cases of PMBPV were evaluated with hysteroscopy and correlated with their histopathological diagnosis. A total number of 9 cases (39%) were diagnosed to have polyp in both hysteroscopic and HPE study. Diagnosis for polyp in PMBPV patients by hysteroscopy sensitivity & specificity was 100%. Carcinoma endometrium was diagnosed in 3 patients (13%) among these PMBPV cases [Table 7].

**Table 4: 1 – 120 Patient**

Hysteroscopic finding +ve	75
Hysteroscopic finding –ve	45
EB finding ++ve	56
EB finding –ve	64
True+ve	50
False+ve	25
True-ve	39
False-ve	6

**(Specfecicity)**

Prevalence	TP + FN / N X 100	46.6 %
Sensitivity	TP / TP + FN X 100	89.2 %
Specificity	TN / TN + FP X 100	60.9 %
Positive Predictivity	TP / TP + FP X 100	57.5 %
Negative Predictivity	TN / TN + FN X 100	86.6 %
Diagnostic Accuracy	TP + TN / N	74.9 %
False positive rate	FP / FP + TN X 100	39 %
False negative rate	FN / FN + TP	10.7 %
Positive likelihood ratio	SENSITIVITY / 1 - SPECIFICITY	2.285 %
Negative likelihood ratio	SPECIFICITY / 1 - SENSITIVITY	5.683 %

TP = True Positive  
FN = False Negative  
TN = True Negative  
FP = False Positive  
N = Total Number Of Patient

**Table 5: Endometrium thickness Total no - 120**

ET IN MM	NO. OF PATIENT
<5	8
5-10	46
11-15	24
16-20	18
>20	24

**Table 6: Pathological Report Co-Related With Endometrium Thickness Measured By Usg Total No - 120**

Pathological report	ET < 5 MM	ET 5 – 10 MM	ET 11-24 MM	ET 16 -20 MM	ET > 20 MM
Normal endometrium	4	36	13	8	5
Hyperplastic	-	4	6	3	7
Polyp	-	3	4	5	6
Ca endometrium	-	1	1	1	3
Rpoc	-	-	-	-	2
Atrophic endometrium	2	-	-	-	-
Endometraitis	2	2	-	-	-
Polyp with hyperplastic endometrium	-	-	-	1	1

**Table 7: co-relation of hystrescopic finding with histopathological study in post menopausal bleeding pv. Total no 23.**

Dh finding	No. Of patients	Histo pathology	No. Of patients
Polyp	9	Benign polyp	8
		Benign polyp with hyperplasia	1
Ca endometrium	2	Ca endometrium	3
Normal endometrium	3	Non secretary	5
Hyperplastic endometrium	6	Hyperplasia	4
Atrophic endometrium	3	Atrophic endometrium	1
Endometritis	-	Endometritis	1

## DISCUSSION

Abnormal uterine bleeding is a broad spectrum signs of pre and postmenopausal women which includes both benign and malignant uterine conditions. It affects 10-30% of reproductive aged women and 50% of postmenopausal women as stated by Prentice A.<sup>[8]</sup> Hence all cases of AUB need a proper evaluation for its diagnosis and management. Various literatures support that AUB is the primary indication for hysteroscopic evaluation.<sup>[9-12]</sup> Menorrhagia being the most common symptoms of AUB, such patients were subjected for DH evaluation in our study which was supported study done by Dr. Channareddy Sunitha etc.<sup>[13]</sup> In present study hysteroscopic finding was normal in 37.5% cases and abnormal in 62.5%. Comparison with various study for normal and abnormal finding in hysteroscopic evaluation was stated below [Table 8].<sup>[14-17]</sup>

**Table 8: Literature review on normal and abnormal hysteroscopic finding.**

Author	Year	Normal %	Abnormal %
Barati	2008	78.2	21.8
Patil	2009	50	50
Gita	2011	26	74
Swati	2013	48	52
Present	217	37.5	62.5

In present study calculated disease prevalence was 46.6%. Sensitivity, specificity, PPV, NPV, FPR, FNR and Diagnostic accuracy of patient with AUB in hysteroscopic evaluation were 89.2%, 60.9%, 57%, 86.6%, 39%, 10.7% and 74.1% respectively. Various study having their sensitivity and specificity were tabulated below [Table 9].<sup>[18-23]</sup>

**Table 9: Literature Review for Sensitivity and specificity in DH**

Author	Year	Sensitivity %	Specificity %
Jakob etc	2001	97	-
Paschopoulos	2001	92	95
Duehlom	2001	84	88
Bonnang	2002	78	97
Kelekei	2005	87.5	100
Tajossadat	2007	100	80.5
Present study	2017	89.2	60.9

Most of the studies show sensitivity for disease diagnosis by hysteroscope is >80% including our study. Detection of endometrial polyp by hysteroscope in various studies the sensitivity calculated were Pasquale Ho et al (2000) was 99%,<sup>[24]</sup> Epstein et al (2001) 80% and by Tajossadat (2007) 93%.<sup>[23,25]</sup> In our study sensitivity for detection of polyp was 100% and PPV & NPV were 90% & 100% respectively. Hence it indicates that polyp can be diagnosed in AUB very accurately by hysteroscope. Almost all cases diagnosed polyp in our study were confirmed by histopathological diagnosis.

Polyp was the most common finding by hysteroscope in PMBPV patients (39%) which was also confirmed by histopathology in our study supported study done by Engin Kormazer.<sup>[25-26]</sup>

In our present study we had also compared endometrial thickness (ET) done by TVS with histopathological diagnosis in all AUB patients. It was revealed that when ET < 5mm all biopsies were either normal or atrophic endometrium. Highest no of polyps (27.7%) were detected when ET is > 15mm same polyps were also detected when ET 10-15mm. Hence AUB patients with ET > 10mm should be subjected for hysteroscope as it is difficult to differentiate between polyp, hyperplasia and fibroid polyp supported by DC Hunter.<sup>[27]</sup> Maximum cases of carcinoma endometrium was detected when ET > 20mm but even detected with ET > 10mm. Hence curettage alone is not safe alternative to hysteroscopy as polyp may often be missed and also may contain focal hyperplastic or malignant changes.<sup>[28]</sup>

## CONCLUSION

Hysteroscopy is a simple low risk day care procedure with very high sensitivity for cavity evaluation in patients of AUB. It provides immediate diagnosis for causes of AUB like submucosal fibroid, atrophic endometrium, retained product of conception and both diagnosis and prompt treatment for cases of polyp. It also helps in targeted biopsy from suspicious areas. All these could have been missed if dilation and curettage (D&C) were done alone for intrauterine pathology. For hyperplasia, carcinoma endometrium, RPOC, tubercular endometritis histopathological diagnosis is confirmative. Hence hysteroscopy can not replace D&C rather it is a complementary procedure with it.

From our study we found that no need of doing hysteroscope or D&C in patients of AUB with ET < 5mm as cases had either normal or atrophic endometrium. It is concluded from our study that in all AUB cases ET measured by TVS can impose an idea of case selection for hysteroscopic procedure. D&C combined with hysteroscopic cavity evaluation is the gold standard.

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