International Journal Dental and Medical Sciences Research
Volume 3, Issue 2, Mar-Apr. 2021 pp 664-675 www.ijdmsrjournal.com ISSN: 2582-6018

Diagnostic Efficacy of Transvaginal Sonography Hysteroscopy and Histopathological Findings in Patient of Post Menopausal Bleeding

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Submitted: 20-03-2021 Revised: 31-03-2021 Accepted: 02-04-2021

ABSTRACT: AIM: To study the diagnostic efficacy of transvaginalsonography hysteroscopy and histopathology in patients of post menopausal bleeding

METHOD The present study is a prospective study done at a tertiary care centre over a period of one year.Total 58 patients with complain of postmenopausal bleeding presenting to gynaecology OPD were selected. Athorough history, clinical examination and routine blood investigationsTransvaginal ultrasonography and hysteroscopy were performed. Diagnostic usefulness and limitations of each method were studied. The ultrasonography and the hysteroscopy findings were then compared with the histopathology report.This analysis then enabled us to frame minimal guidelines required to evalute a case of PMB.

RESULT:In present study about many of patients were diagnosed to have more than one pathology of PMB.The causes were divided in benign lesions accounting for 91.4 % and malignant lesions accounting for 8.6%.There were 5 cases of caendometrium accounting for 8.6% incidence.Transvaginalsonography has 90.48% sensitivity and 94.54% specificity 90.48% PPV 94.59% NPV and 92.2% accuracy..Hysteroscopy sensitivity of 92.31% specificity 100% PPV 100% and 86.36%NPV to know cause of PMB. The diagnostic accuracy is 96.18%.

Conclusion:We recommend the routine use of pelvic ultrasonography in all women with postmenopausal bleeding as it is an invaluable diagnostic tool in excluding adnexal pathology. In addition, sampling of the endometrial cavity, preferably with hysteroscopy, is mandatory for histological diagnosis.

Keywords: Postmenopausal Bleeding, Endometrial Carcinoma, thickened endometrium, transvaginalsonography, hysteroscopy, hystopathology.

I. INTRODUCTION AND BACKGROUND

Background: Menopause in Latin means- Men-Month & Pause- Cessation.

Postmenopausal bleeding (PMB) can be defined as uterine bleeding occurring at least one year after menopause. PMB is a common clinical problem in both general and hospital settings[1,2]. The incidence of spontaneously occurring PMB in the general population can be as high as 10% immediately after menopause [3].PMB is often caused by abnormalities of the endometrium, whether they are benign or malignant. Of postmenopausal womenwith vaginal bleeding, 10%–15% have endometrial carcinoma[4,5,6].

Causes of PMB[2]

a) Exogenous estrogen: Estrogen supplements, HRT, Tamoxifen (estrogen receptor stimulator) Estrogen herbal supplementation.

b) Endogenous estrogen; peripheral conversion of androstenedione Estrogen producing tumor.

c) Atrophic vaginitis.

d) Benign conditions like cervical polyp, endometrial hyperplasia, sub mucosal fibroid, cervicitis and vaginitis.

e) Malignancy Ca Cervix, Ca Endometrium ,Ca Vulva, Vaginal Wall Cancer, fallopian tube cancer, uterine sarcoma, ovarian malignancy.

f) Miscellaneous Trauma, Forgotten IUCD, Pessory, Tampons, Coitus Decubitus ulcer Anticoagulant therapy.

Diagnostic Strategies for Postmenopausal Bleeding

In clinical practice, tests are commonly combined in diagnostic sequences and disease probabilities are usually estimated in a hierarchical manner, first combining information from history and patient characteristics followed by

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Volume 3, Issue 2, Mar-Apr. 2021 pp 664-675 www.ijdmsrjournal.com ISSN: 2582-6018

in]n6rehbl,formation from additional testing which includes transvaginalsonography, dialatation and curettage, CT and MRI,hysteroscopy and endometrial sampling.

II. MATERIALS AND METHODS

This is a prospective study conducted at a tertiary carecentre during over period of one year.Study was started after institutional ethical committee approval and after duly replying the queries of ethical committee.

Inclusion criteria:

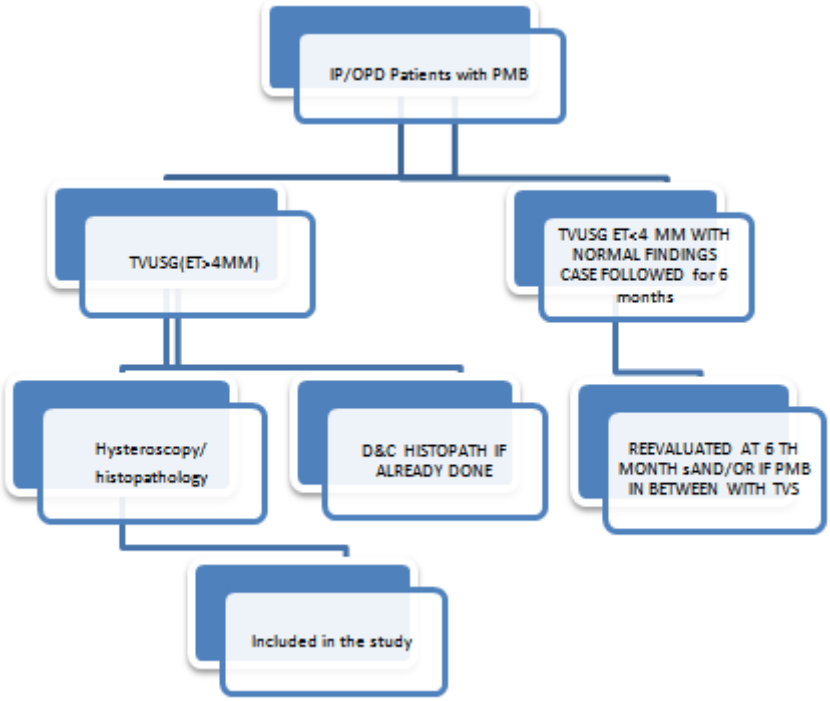
- Patients presenting with post menopausal bleeding with period of amenorrhea 1 year or more
- Age more than 40 years,justification; premature menopause is defined before 40 years.

Exclusion criteria:

- Pregnancy
- Hormone producing Ovarian tumors
- Endocrine disorders like hyper- or hypothyroidism, adrenal disease pitutory disorders
- Coagulation disorders, liver/renal diseases
- Known case of Cervical or uterine malignancy
- Medications like steroids, neuroleptics, anticoagulants and cytotoxic agents
- Blood dyscrasias

III. VII.METHODOLOGY:

Patients admitted in Lilavati hospital and research centre under care of various consultants in the department of obstetric and gynecology. Patients fulfilling the inclusion criteria will be offered to participate in the study. Carefull history written consent clinical examination followed by TVS Hysteroscopy and Hystopathology.



IV. RESULTS

TABLE 1

VARIOUS ETIOLOGYS OF POST MENOPAUSAL BLEEDING .

	NUMBER OF CASES	PERCENTAGE
MALIGNANT		
Ca Endometrium	5	8.6
Total	5	8.6
BENIGN		
ENDOMETRIAL HYPERPLASIA	20	34.5

Fibroid(intramural+submucous)	11	19
Endometial +cervical Polyp	15	25.9
Atrophicvaginitis	3	5.2
Prolapse + decubitus	1	1.7
Chronic cervicitis	3	5.2
Total	53	100

According to our study as shown in **Table 1**benign cause constitute 91.3% and malignant 8.7%.Endometrial hyperplasia accounting for 34.5% cases followed by polyp 25.9% cases are the most common benign causes .Fibroids constitute for 22.4% .Chronic cervicitis and Atropic vaginitis each contribute 6.1 % with a single case of Prolapse with decubitus ulcer constituting 2%.

TABLE 2
FINDINGS OF TRANS VAGINAL SONOGRAPHY IN PATIENTS OF PMB.

Findings of TVS	Number	Percentage (%)
Normal	22	37.9
Bulky	27	46.6
Raised endometrial thickness >/=4mm	58	100
Polyps	9	15.5
Submucosal fibroid	7	12.1
Intramural fibroid	4	6.9
Subserosal fibroid	0	0.0
Normal ovaries	50	86.2
Ovarian cysts	7	12.1
cervical polyp	3	5.2
other ovarian cyst	1	1.7
Ca endometrium	2	3.4

Table 2 shows finding of TVS in our study ,since raise endometrial thickness ET 4mm and more was the inclusion criteria all patient comes into this group.Bulky uterus was seen in 46.6%,polyps in 15.5 % submucosal fibroid in 12.1 % and cervical polyp 5.2% .There were total 2 cases with TVS showing suspicious endometrial malignancy needs further evaluation. There were total 7 cases of simple ovarian cyst and single case of Para ovarian cyst.

TABLE 3.
FINDINGS OF HYSTEROSCOPY IN PATIENTS OF PMB

Findings of Hysteroscopy	Number	Percentage (%)
Normal uterine cavity	35	60.3
Hyperplastic endometrium	36	62.1
Atrophic Endometrium	6	10.3
Hyperemic Endometrium	1	1.7
Single endometrial polyp	9	15.5
Multiple endometrial polyps	3	5.2
Endocervical polyp	3	5.2
submucousmyoma	5	8.6
cervical fibroid	2	3.4
Profuse /unhealthy /vascular endometrium s/o malignancy ca endometrium	4	6.8

As per **Table 3**Hyperplastic endometrium was seen in maximum number of cases 62.1%, endometrial polyps (single +multiple) constitute 20.7% while endocervical polyp is seen in 5.2 % ,

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submucousmyoma constitute 8.6% and cervical fibroid 3.4%.4 cases the endometrium was unhealthy either fragile profuse vascular indicaticating malignancy.

TABLE 4
FINDINGS OF HISTOPATHOLOGY IN PATIENTS OF PMB

Findings of histopathology	Number	Percentage (%)
Simple hyperplasia without atypia	25	43.1
Ca endometrium	5	8.6
Proliferative	18	31.0
Secretory	1	1.7
Benign hyperplastic polyp	11	19.0
Benign functional polyp	3	5.2
Benign endocervical polyp	2	3.4
Atropic	6	10.3
Simple leiomyoma	5	8.6

Most common finding on histopathology was simple endometrial hyperplasia without atypia .5 cases out of 58 had ca endometrium .Polyps were seen in 27.7% cases .Atrophic endometrium constitute 10.3% fibroid were seen in 8.6% as seen in **Table 4**

TABLE 5
ASSOCIATION BETWEEN TVS AND HYSTEROSCOPY FOR ENDOMETRIAL POLYP

Polyps on TVS	Polyps on hysteroscopy	
	Yes	No
Yes	12	2
No	3	41

According to above **Table 5**
Parameter 95% Confidence Interval
Sensitivity: 80.0% (51.91%, 95.67%)
Specificity: 95.35% (84.19%, 99.43%)
Positive Predictive Value (PPV):85.71% (60.23%, 95.96%)
Negative Predictive Value (NPV): 93.18% (83.21%, 97.41%)
FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001
Accuracy: 81.68**%**
Conclusion ;There is association between TVS and hysteroscopy for diagnosis of endometrial polyp. Hysteroscopy is a better diagnostic technique.

TABLE 6
ASSOCIATION BETWEEN TVS AND HISTOPATHOLOGY FOR ENDOMETRIAL POLYP

Polyps on TVS	Polyps on histopathology	
	Yes	No
Yes	10	0
No	6	42

According to **Table 6**
Parameter 95% Confidence Interval
Sensitivity: 62.65% (35.43%, 84.80%)
Specificity: 100.0% (91.59%, 100.0%)
Positive Predictive Value (PPV):100.0%
Negative Predictive Value (NPV): 87.50% (78.81%, 92.95%)
Accuracy: 81.33%

FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001

Conclusion ;There is association between TVS and histopathology for diagnosis of endometrial polyp. Histopahology is a better diagnostic technique.

TABLE 7
ASSOCIATION BETWEEN HYSTEROSCOPY AND HISTOPATHOLOGY FOR ENDOMETRIAL POLYPS

Polyps on hysteroscopy	**Polyps on histopathology**	
	Yes	No
Yes	15	-
No	1	42

According to **Table 7**

Parameter	95% Confidence Interval
Sensitivity: 93.75%	(69.77%, 99.84%)
Specificity: 100.0%	(97.59%, 100.0%)
Positive Predictive Value (PPV):100.0%	
Negative Predictive Value (NPV): 97.67%	(86.29%, 99.64%)
Accuracy: 96.88%	

FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001
Conclusion ;There is association between hysteroscopy and histopathology for diagnosis of endometrial polyp. Histopahology is a better diagnostic technique.
From the above tables it is clear that sensitivity specificity and negative predictive value of hysteroscopy is better than TVS for polyps

AS per the operational formula the diagnostic accuracy of a test can be calculated by the formula sensitivity +specificity /2
According to that diagnostic accuracy of TVS is for endometrial polyp nearly 81.33% and HS is 96.88%
Discussion: Here we will see the association between different investigation modalities for individual causes of post menopausal bleeding followed by comparing them with previous studies.

TABLE 8
ASSOCIATION BETWEEN TVS AND HYSTEROSCOPY FOR SUBMUCOUS FIBROID

submucosal fibroid on TVS	**submucosal fibroid on hysteroscopy**	
	Yes	No
Yes	5	2
No	0	51

According to **Table 8**

Parameter	95% Confidence Interval
Sensitivity: 100.00%	(42.82%, 100.0%)
Specificity: 96.23%	(87.02%, 99.54%)
Positive Predictive Value (PPV): 71.43%	(39.10%, 90.69%)
Negative Predictive Value (NPV): 100.0%	
Accuracy: 98.12%	

FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001

Conclusion ; There is association between TVS and hysteroscopy for diagnosis of submucous fibroid. Hysteroscopy is a better diagnostic technique.

TABLE 9
ASSOCIATION BETWEEN TVS AND HISTOPATHOLOGY FOR SUBMUCOUS FIBROID

submucosal fibroid on TVS	**submucosal fibroid on histopathology**

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	Yes	No
Yes	5	2
No	0	51

As per **Table 9**

Parameter	95% Confidence Interval
Sensitivity: 100.00%	(47.83%, 100.0%)
Specificity: 96.36%	(87.47%, 99.56%)
Positive Predictive Value (PPV): 71.43%	(39.07%, 90.69%)
Negative Predictive Value (NPV): 100.0%	
Accuracy: 98.12%	

FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001
Conclusion ;There is association between TVS and histopathology for diagnosis of submucous fibroid. Histopahology is a better diagnostic technique.

TABLE 10
ASSOCIATION BETWEEN HYSTEROSCOPY AND HISTOPATHOLOGY FOR SUBMUCOUS FIBROID

submucosal fibroid on hysteroscopy	**submucosal fibroid on histopathology (gold standard)**	
	Yes	No
Yes	5	0
No	0	53

As per**Table 10**

Parameter	95% Confidence Interval
Sensitivity: 100.0%	(47.82%, 100.0%)
Specificity: 100.0%	(93.28%, 100.0%)
Positive Predictive Value (PPV): 100.0%	
Negative Predictive Value (NPV): 100.0%	
Accuracy: 100.00%	

FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001
Conclusion ;There is association between hysteroscopy and histopathology for diagnosis of submucous fibroid. Histopahology is a better diagnostic technique.
As per the operational formula the diagnostic accuracy of a test can be calculated by the formula sensitivity +specificity /2.
According to that diagnostic accuracy of TVS for submucous fibroid is nearly 98.12% and HS is 100%.
From the above table it is seen that specificity and PPV of HS is better than TVS for diagnosis of submucous fibroid.

TABLE 11
ASSOCIATION BETWEEN TVS AND HYSTEROSCOPY FOR ENDOMETRIAL HYPERPLASIA

Raised ET> 4mm on TVS	**Hyperplastic endometrium on hysteroscopy**		**Total**
	Yes	No	
Yes	36	22	58
No	00	00	00
Total	36	22	58

As per **Table 11** FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001

Parameter	95% Confidence Interval
Sensitivity: 100.0%	(90.26%, 100.00%)
Specificity: 0.0%	(0.0%, 15.44%)
Positive Predictive Value (PPV):62.07%	(62.07%, 62.07%)
Negative Predictive Value (NPV): Not Possible	
Accuracy: 50.00%	

Conclusion ;There is association between TVS and hysteroscopy for diagnosis of raised endometrial thickness. Hysteroscopy is a better diagnostic technique.

Comment: results should be interpreted cautiously as due to inclusion criteria all patient with endometrial thickness ≥ 4 mm are included in our study and ET>4mm is considered raised thickness for post menopausal patient

TABLE 12
ASSOCIATION BETWEEN TVS AND HISTOPATHOLOGY FOR RAISED ENDOMETRIAL THICKNESS

Raised endometrial thickness on TVS	**Hyperplastic endometrium on hysteroscopy**		**Total**
	Yes	No	
Yes	36	22	36
No	00	00	22
Total	36	22	58

As per **Table 12**
FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001

Parameter	95% Confidence Interval
Sensitivity: 100.0%	(90.26%, 100.00%)
Specificity: 0.0%	(0.0%, 15.44%)
Positive Predictive Value (PPV):62.07%	(62.07%, 62.07%)
Negative Predictive Value (NPV): Not Possible	
Accuracy: 50.00%	

Conclusion ;There is association between TVS and histopathology for diagnosis of raised endometrial thickness. Histopathology is a better diagnostic technique.

Comment ; results should be interpreted cautiously as due to inclusion criteria all patients with endometrial thickness ≥ 4 mm are included in our study and ET>4mm is considered raised thickness for post menopausal patient.

TABLE 13
ASSOCIATION BETWEEN HYSTEROSCOPY AND HISTOPATHOLOGY FOR RAISED ENDOMETRIAL THICKNESS

Hyperplastic endometrium on hysteroscopy	**Hyperplastic endometrium on histopathology**		**Total**
	Yes	No	
Yes	36	00	36
No	00	22	22
Total	36	22	58

As per **Table 13**

Parameter	95% Confidence Interval
Sensitivity: 100.0%	(90.26%, 100.0%)
Specificity: 100.0%	(84.56%, 100.0%)
Positive Predictive Value (PPV): 100.0%	
Negative Predictive Value (NPV): 100.0%	
Accuracy: 100.00%	

FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001
Conclusion ;There is association between hysteroscopy and histopathology for diagnosis of raised endometrial thickness. Hystopathology is a better diagnostic technique.
As per operational formulae the diagnostic accuracy of TVS is nearly 50%and hysteroscopy is 100%.

TABLE 14
ASSOCIATION BETWEEN TVS AND HISTOPATHOLOGY FOR CA ENDOMETRIUM

Ca endometrium on TVS	**Ca endometrium on histopathology**		**Total**
	Yes	No	
Yes	2	0	2
No	3	53	56
Total	5	53	58

According to **Table 14**
FISHER EXACT PROBABILITY TEST VALUE=0.006, DF=1, S, P=0.006

Parameter 95% Confidence Interval
Sensitivity: 40.00% (5.27%, 83.34%)
Specificity: 100.0% (93.28%, 100.0%)
Positive Predictive Value (PPV):100.0%
Negative Predictive Value (NPV): 94.64% (89.62%, 97.31%)
Accuracy: 70.00%
Conclusion ;There is association between TVS and histopathology for diagnosis of ca endometrium. Histopathology is a better diagnostic technique.

TABLE 15
ASSOCIATION BETWEEN HYSTEROSCOPY AND HISTOPATHOLOGY IN CA ENDOMETRIUM

Ca endometrium on hysteroscopy	**Ca endometrium on histopathtology**		
	Yes	No	Total
Yes	4	0	4
No	1	53	54
Total	5	53	58

As per **Table 15**
FISHER EXACT PROBABILITY TEST VALUE=<0.001, DF=1, S, P<0.001
Parameter 95% Confidence Interval
Sensitivity: 80.0% (28.36%, 99.49%)
Specificity: 100.0% (93.28%, 100.0%)
Positive Predictive Value (PPV):100.0%
Negative Predictive Value (NPV): 98.15% (90.18%, 99.67%)
Accuracy: 90.00%

Conclusion ;There is association between hysteroscopy and histopathology for diagnosis of Ca endometrium. Histopathology is a better diagnostic technique.
From above table it can be made out that both sensitivity and negative predictive value of hysteroscopy is better than TVS in diagnosing ca endometrium.
Diagnostic accuracy of TVS in ca endometrium is 70 % and HS is 90

Table 16:
Comparative studies on Benign and malignant causes

Study	Sengupta et al[7]	Sunita T et al[8]	Present study

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Bening	40%	76%	91.4%
Malignant	60%	24%	8.6%

The causes of postmenopausal bleeding in our study were divided mainly in 2 groups i.e. benign in 91.4% cases and malignant in 8.6% note this study excludes known cases of ovarian and cervical malignancy.

Senguptaet al[7] in1989 found malignancy in 40 % cases and benign lesions in 60 % cases. Sunita et[8] all found 24 % malignant cases as shown in **Table 16.**

Table 17 :
Comparative studies of TVS

STUDY	Bronze L et al[9]	Waleed El khayat et al[10]	Ali Babacani et al[11]	Karlson et al[12]	Garuti G et al [13]	Sunita T et al[8]	Present study
Endometrial polyp	16%	08	54% 84%			5(8.3)	15.5%
Submucosal fibroid	37%	03				1(1.66)	12.1%
Hyperplastic endometrium	8%	16		12		3(5)	100%*
Sensitivity	92%	92.3	96	100	95.1	75	90.48%
Specificity	86%	72.72	13.8	75	54.8	98.2	94.59%
PPV	96%	92.3	71.7	90	63.7		90.48%
NPV	79%	72.72	37.04	100			94.59%
ACCURACY		88					92.5%

100% cases had increased endometrial thickness on TVS because we have included all patients with increased endometrial thickness.**Table 17** shows various findings of TVS with comparative studies like Bronze L et al[9] ,Waleed El khayat et al[10], Ali Babacani et al[11],Karlson et al[12],Garuti G et al [13].

Table 18:
Comparative studies on hysteroscopy

STUDY	Karlson et al [12]	Garuti G et al[13]	Waleed El Khayatet al[10]	Sunita t et al[8]	Present study
Polyp	9		14	7(11.66)	25.9%
Fibroid	1		03	1(1.66)	12.0%
Endometrial hyperplasia	1		08	4(6.67)	62.1%
Ca endometrium				7(11.66)	6.8
Atrophic endometrium				36(39.65)	10.3
Sensitivity	97	96.5	78.75	95	92.31%
Specificity	88	93.6	95.83	100	100%
PPV	94	92.6	98.43		100%
NPV	93		57.5		86.36%
ACCURACY			84		96.18%

As per**Table 18** hysteroscopy is an important method for diagnosing as well as in some cases treating the causes of PMB in same sitting. In present study the most common pathology detected on HS was endometrial hyperplasia followed by endometrial polyp.In present study the overall sensitivity of hysteroscopy is 92.31 % which is comparable to studies by Karlson et al[12], Garuti et al[13] and Sunita et al[8].

The specificity and PPV of hysteroscopy is 100 % similar to results of Sunitaet al[8] and Waleed et al[10].

STUDY	Karlson et al [12]	Sunita T et al [8]	WaleedEL khayat et al[10]	AliBabaca net al[11]	Lidor A et al[14]	Gred mark T et al[15]	Bronze L et al[9]	Present study
POLYP	9	7(11.6)	14	133		9%	44.5	27.6%
SUBMUCOUS FIBROID	2	1(1.66)	2	12			7.1	8.6%
ENDOMETRIAL HYPERPLASIA	9	4(6.66)	17	03	15%	10%	12.5	43%
BENING							76.8	91.4%
Endometrial Ca	10%	8(13.33)			7%	15%	7.1	8.6%
Atrophic		40(60.66)			45%	50%		10.3%

The NPP of present study was 86.36 % which was comparable to result of Karlsonet al[12].

The accuracy of hysteroscopy in present study is 96.18%.

Table 19-Comparative study on histopathology

The most common pathology detected in present study on histopathology is Simple Endometrial Hyperplasia without Atypia it was seen in 43% cases while atrophic endometrium was seen in 10.3 % cases these findings are reverse as compared to other studies because present study only includes patients with ET≥ 4mm which is the lower limit of raise endometrial thickness for postmenopausal patient. Endometrial polyp and fibroid were seen in 27.6 % and 8.6% respectively which is comparable to 7 % polyp by Bronze et al[9]. Comparative result were seen in studies byLidor A et al[14] and Gredmark T et al[15].Carcinoma endometrium was seen in 8.6 % which is comparable to findings of Karlson et al[12], Sunita et al[8] and Bronze et al[9] as shown in **Table 19.**

Table 20:
Comparative studies for sensitivity specificity PPV and NPVfor various etiology of pmb.

STUDY	Sunita T et al [8]	Ali babacan et al[11]	Waleed El Khayat et al[10]	Present study
Polyps on TVS	71.4% 96.36%	54.9% 84.9% 76% 68.3%	76.92% 91.89% 76.92% 91.98%	62.65% 100% 100% 87.5%
Polyps on HS	100% 100%	82% 84.9% 82.6% 84.3%	92.3% 94.59% 85.71% 97.22%	93.75% 100% 100% 97.67%
Submucosal fibroid on TVS	100% 100%			100% 96.36% 71.43% 100%
Submucosal fibroid on HS	100% 100%			100% 100% 100% 100%
Endometrial hyperplasia on TVS	75% 98.2%		60% 84.78% 94% 67.74%	sn100% PPV 62%

Endometrial hyperplasia on HS	100% 100%		40.38% 98.04% 95.45% 62.19%	100% 66.67% 69.44% 100%
Overall TVS Sensitivity Specificity PPV NPV Accuracy	75 98.2	96% 13.8% 71% 60%	92.3% 72.72% 92.3% 72.72% 88%	90.48% 94.59% 90.48% 94.59% 92.2%
Overall HS Sensitivity Specificity PPV NPPV ACCURACY	98 100	92.9% 41.4% 78.3% 72%	78.5% 95.83% 98.43% 57.5% 84%	92.31% 100% 100% 86.36% 96.18%
Carcinoma endometrium TVS Sensitivity Specificity PPV NPPV ACCURACY	50% 92.8%			40% 100% 100% 94.64% 70%
Carcinoma endometrium on hysteroscopy Sensitivity Specificity PPV NPPV ACCURACY	87.5% 98.1%			80% 100% 100% 98.15% 90%

As per the above table sensitivity, specificity, PPV and NPP of TVS and hysteroscopy in comparison with histopathology are calculated. They are compared with several other studies.

The sensitivity and negative predictive value of HS is better than TVS for diagnosis of endometrial polyp.

The specificity and PPV of HS is better than TVS in diagnosing submucous fibroid.

The specificity NPP and PPV of HS is better than TVS for diagnosing of endometrial hyperplasia.

The sensitivity and NPP of HS is better than TVS in diagnosing carcinoma endometrium.

The overall sensitivity of TVS in present study is 90.48 % which is similar to results of Waleedet al[10] and Ali Babacan et al[11], the specificity of TVS 94.59% which is similar to results by Sunita et al[8]. The PPV of TVS is 90.48% which is comparable to Waleedet al[10].

The overall sensitivity of HS is 92.31% which is similar to results by Ali Babacanet al[11]. The specificity and PPV of HS is 100% which is similar to results by Waleedet al[10] and Sunita et al[8] as shown in **Table 20.**

V. CONCLUSION

- Postmenopausal bleeding is an agonizing symptom, met with fear and anxiety of malignancy and hence requires urgent need of investigations, either to prove or disprove it.
- The dictum "All the cases of postmenopausal bleeding should be considered as malignancy until proved otherwise" is very significant.
- Each and every case of post menopausal bleeding should be evaluated properly due to risk of associated carcinoma.
- I would like to stress that good clinical history and a through clinical examination cannot be replaced by diagnostic investigation like trans

vaginal sonography and hysteroscopy .These test definitely strengthen the diagnosis accurately.

- Hysteroscopy is highly accurate for evaluating endometrium. For obvious benign lesions, it also provides treatment in the same sitting, therefore avoiding an extensive, morbid, and expensive procedure like hysterectomy.
- We recommend the routine use of pelvic ultrasonography in all women with postmenopausal bleeding as it is an invaluable diagnostic tool in excluding adnexal pathology. In addition, sampling of the endometrial cavity, preferably with hysteroscopy, is mandatory for histological diagnosis.
- A cut off of 4mm for endometrial thickness seemed appropriate No cases of endometrial malignancy were missed when 4mm was taken as the cut-off. Endometrial thickness on transvaginalsonography can be used with cut off level of 4mm to exclude endometrial malignancy and can obviate unnecessary curettages.
- Hysteroscopy and directed biopsy is the gold standard for diagnosis of endometrial pathologies.

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