International Journal Dental and Medical Sciences Research
Volume 6, Issue 5, Sep - Oct 2024 pp 195-200 www.ijdmsrjournal.com ISSN: 2582-6018

Role of TVS in evaluation of postmenopausal bleeding.

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Submitted: 10-09-2024 Accepted: 20-09-2024

ABSTRACT

Background : The clinical approach to postmenopausal bleeding requires prompt and efficient evaluation to exclude or diagnose endometrial carcinoma and endometrial intraepithelial neoplasia.Transvaginal ultrasonography is a reasonable alternative to endometrial sampling as a first approach in evaluating a postmenopausal woman with an initial episode of bleeding.

Aims and objectives : The aim of this study is to evaluate the role of transvaginal ultrasonography in postmenopausal bleeding.

Material & methods : A total of 60 cases were taken. A detailed history and examination of the patients were done. The patients were counseled for the procedure, informed consent taken and transvaginalsonograph was done in all cases for endometrial thickness followed by hysteroscopy.Hysteroscopic evaluation of uterine cavity with hysteroscope under GA was carried out after all necessary investigations.Hysteroscopic directed endometrial biopsy was taken. Histopathological diagnosis was taken as final diagnosis.The selected data was compiled and analyzed statistically.

Results :Atrophic endometrium was most frequent finding in post menopausal bleeding (40.00%) followed by endometrial hyperplasia and polyp in 18.33% each. 13.33% had carcinoma endometrium and 10% of the patients had fibroid. The overall sensitivity of TVS came out to be 94.4%, specificity 95.8%, PPV 97.1%, NPV 92.1% and diagnostic accuracy 95% in the present study. The overall sensitivity of hysteroscopy came out to be 97.2%, specificity 100%, PPV 100%, NPV 96% and diagnostic accuracy 98.3% in the present study.

Conclusion : We conclude that in post menopausal bleeding hysteroscopy is a valuable diagnostic tool for all endometrial lesions with TVS as the screening tool.

Keywords : postmenopausal, transvaginal ultrasonography, hysteroscopy

I. INTRODUCTION

Postmenopausal bleeding is defined as blood loss occurring at least 12 months after menopause.[1] It is more likely caused by pathologic disease as compared to bleeding in younger women, and it must always be investigated. Following are the common causes of postmenopausal bleeding:

- Exogenous estrogens
- Atrophic endometritis/vaginitis
- Endometrial cancer
- Endometrial or cervical polyps
- Endometrial hyperplasia[2]

Pelvic ultrasonographic examination and, in particular, transvaginal ultrasonography can suggest the cause of bleeding.[3-4] It is also used to note the endometrial thickness (ET) which is increased in endometrial hyperplasia and carcinoma. Doppler ultrasound showing increased blood flow is suggestive of malignancy. An Endometrial sampling, through office biopsy, hysteroscopy, or D&C, is usually considered essential. Fractional curettage under general anesthesia to obtain tissue for histopathology is considered an outdated procedure now. Less invasive procedures like aspiration biopsy from endometrium with endocervicalcurretings or office hysteroscopy and biopsy can be done in OPD setup.Hysteroscopic directed biopsy offers the possibility of visualizing focal abnormalities like polyps and taking directed biopsies [5-6]. Hysteroscopy is the gold standard for evaluating the uterine cavity, diagnosing intrauterine pathology, and operative intervention for some causes of PMB with TVS used for initial evaluation.[7]

II. MATERIAL AND METHODS

The present study was carried out in 60 patients presenting with postmenopausal bleeding to the OPD of Department of Obstetrics and Gynaecology, Government Medical College and Rajindra Hospital, Patiala. The patients were counseled about the plan of evaluation and the

International Journal Dental and Medical Sciences Research
Volume 6, Issue 5, Sep - Oct 2024 pp 195-200 www.ijdmsrjournal.com ISSN: 2582-6018

procedure. Informed consent was taken after explaining all the complications to the patient.

INCLUSION CRITERIA : Following patients were included in the study-
 Patients with post menopausal bleeding.
EXCLUSION CRITERIA The following patients were excluded from the study-
 Women taking hormonal replacement therapy.
 Obvious cause of bleeding from cervix and vagina.
 Known blood dyscrasias. On anticoagulant therapy.
 Surgical menopause.

Materials used in the study:
1. Hysteroscope: Gebrauchsanweisung – Diagnostic 4mm rigid Karl Storz Aida @ WD200 and WD 250 endoskope was used with a 30 degree oblique aperture view with a 5 mm sheath.
2. For TVS , TVS probe of the following ultrasound machines was usedPHILLIPS brand model HD-11XE and model Envisor C and SAMSUNG company model USSAVXGE 30/N S.NO. SOY3M3HH700003F.

Method of study :

A complete detailed history to find out cause of postmenopausal bleeding was taken including age, parity, menstrual history, obstetric history, medical history, surgical history and personal history. General physical examination, per abdomen, local examination, per speculum and pervaginum examination were performed. The endometrial thickness (ET) was measured on TVS. Other parameters like polyp, fibroid, growth, adnexal and uterine pathology were noted. On TVS, atrophic endometrium is thin, homogenous and echogenic. In polyp, TVS shows a nonspecific thickening of the central endometrial complex , with or without cystic changes. A distinct hyperechoic line partially or completely surrounds the abnormal endometrial complex. There is a well defined endometrial thickening with or without cysts in endometrial hyperplasia. On TVS, a submucosal fibroid may appear hypoechoic or show heterogeneous echogenicity and may demonstrate acoustic attenuation. The fibroid may displace or distort the endometrium or cause false endometrial thickening. TVS examination shows an irregular, patchy and partially echogenic endometrium with poorly defined thickening in endometrial carcinoma..

Hysteroscopy was performed in all cases.Endometrial biopsies were taken in all patients. Polypectomy was done in required cases. Histopathological examination was done and was considered as the final diagnosis. The Data collected was analysed using Microsoft Excel Office software 2019 version 19.11 and Epi info (CDC Atlanta) version 7.2.3.1 and appropriate statistics were applied.

III. RESULTS :

Out of 60 patients, 24 (40%) were in the age group 45-54 years, 26 (43.33%) in the age group of 55-64 years and 10 (16.67%) were in the age group of ≥65 years. 6.6% patients were of low parity ≤1 child and 28.34% patients had >3 children. The mean age at menopause was 48.95±3.06 years. The mean BMI was 26.00±3.50 kg/m2 with 45% patients having BMI <25 kg/m2 and 55% patients had BMI ≥ 25 kg/m2. 41.67% patients had history of hypertension, 26.67% patients had diabetes mellitus, 13.33% patients had hypothyroidism while there were 5% patients with breast cancer and history of AUB each. 31.66% patients had no medical history. There were some patients who had more than one medical disorder.

Table – 1
TVS Findings

TVS group	No. of Patients	Percent
Atrophy	25	41.67%
Carcinoma	5	8.33%
Fibroid	8	13.33%
Hyperplasia	16	26.67%
Polyp	6	10.00%
TOTAL	**60**	**100.00%**

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41.67% patients were found to have atrophic endometrium ultrasonographically, 26.67% patients had endometrial hyperplasia. 8.33% patients had carcinoma endometrium. Fibroid was detected in 13.33% patients while polyp was reported in 10% of the patients. No patient had more than 1 pathology.

TABLE-2
COMPARISON OF DIAGNOSTIC ACCURACY OF ENDOMETRIAL THICKNESS

Parameter	<3mm	≤3mm	<4mm	≤4mm	<5mm	≤5mm	<6mm
Sensitivity	1	1	0.917	0.920	0.920	0.920	0.793
Specificity	0.667	0.783	0.944	0.971	0.971	0.971	0.968
Positive Predictive Value	0.25	0.583	0.917	0.958	0.958	0.958	0.958
Negative Predictive Value	1	1	0.944	0.944	0.944	0.944	0.833
Accuracy	0.7	0.833	0.933	0.950	0.950	0.950	0.883
Sensitivity +Specificity	1.667	1.783	0.861	1.891	1.891	1.891	1.761

According to above table-the maximum diagnostic accuracy of endometrial thickness was found at values of ≤4mm, <5mm and ≤5mm, the lowest limit being ≤4mm (cut off value).

TABLE-3
ENDOMETRIAL THICKNESS

ET Classification in mm	**Frequency**	**Percent**
≤4	25	41.67%
> 4	35	58.33%
TOTAL	**60**	**100.00%**

In the present study 58.33% patients had endometrial thickness >4mm and 41.67% patients had endometrial thickness ≤4mm. The mean endometrial thickness was 8.68±6.45 mm.

TABLE-4
HYSTEROSCOPY FINDINGS

Hysteroscopy group	**No. of patients**	**Percent**
Atrophy	25	41.67%
Carcinoma	7	11.67%
Fibroid	6	10.00%
Hyperplasia	11	18.33%
Polyp	11	18.33%
TOTAL	**60**	**100.00%**

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Atrophic endometrium (41.67%) was the most common abnormality detected on hysteroscopy followed by endometrial hyperplasia and polyp in 18.33% each. In 11.67% carcinoma endometrium was detected while fibroid was found in 10% of the patients.

TABLE-5
HISTOPATHOLOGICAL FINDINGS

HPE group	**No. of patients**	**Percent**
Atrophy	24	40.00%
Carcinoma	8	13.33%
Fibroid	6	10.00%
Hyperplasia	11	18.33%
Polyp	11	18.33%
TOTAL	**60**	**100.00%**

Atrophic endometrium was most frequent finding in post menopausal bleeding (40.00%) followed by endometrial hyperplasia and polyp in 18.33% each. 13.33% had carcinoma endometrium and 10% of the patients had fibroid.

TABLE-6
MEAN ET

ET (in mm)2 * HPE group	**Obs**	**Total**	**Mean**	**Var**	**StdDev**	**Min**	**25%**	**Median**	**75%**	**Max**	**Mode**
Atrophy	24	78.6	3.275	1.162	1.0779	1.8	2.85	3	3.5	7.8	3
Carcinoma	8	138.6	17.325	34.2164	5.8495	6	14.3	19	20.5	25	20
Fibroid	6	37.6	6.20	0.93	0.96	5.2	5.6	6	6.6	8.2	6
Hyperplasia	11	167.5	15.2273	19.6202	4.4295	9	10	16.5	19	20.4	10
Polyp	11	98.5	8.9545	21.7227	4.6608	3.2	5.5	8	14	16.6	8
ANOVA P Value	0.0000 HS										

In the present study mean ET in atrophy was 3.27±1.08 mm, hyperplasia 15.23±4.43 mm, carcinoma 17.32±5.85 mm, fibroid 6.20±0.96 mm, and polyp 8.95±4.66mm. P value with anova test was highly significant.

TABLE-7
CORRELATION BETWEEN TVS AND HISTOPATHOLOGY

	HPE group yes/no		
TVS group Yes/no	**Yes**	**No**	**Total**
Yes	34	1	35
Row %	97.14%	2.86%	100.00%
Col %	94.44%	4.17%	58.33%
No	2	23	25
Row %	8.00%	92.00%	100.00%
Col %	5.56%	95.83%	41.67%
Total	36	24	60
Row %	60.00%	40.00%	100.00%
Col %	100.00%	100.00%	100.00%

Considering atrophic endometrium as normal finding in postmenopausal women, all other diagnosis including carcinoma endometrium, submucosal fibroid, endometrial hyperplasia and polyp were grouped as pathologies in the above table-. As per above table-, out of 36 patients in

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whom histopathology confirmed any pathology as above said, ultrasound detected some pathology in 34 and missed in two cases. Similarly, out of 24 patients with atrophic endometrium on histopathology ultrasound could detect the same in 23 cases.

TABLE-8
SENSITIVITY, SPECIFICITY, PPV, NPV AND DIAGNOSTIC ACCURACY OF TVS

Parameter	Overall	Atrophy	Carcinoma	Fibroid	Hyperplasia	Polyp
Sensitivity	0.944	0.958	0.625	1.000	1.000	0.545
Specificity	0.958	0.944	1.000	0.963	0.898	1.000
Positive Likelihood Ratio	22.667	17.250	----	27.000	9.800	------
Negative Likelihood Ratio	0.058	0.044	0.375	0.000	0.000	0.455
Positive Predictive Value	0.971	0.920	1.000	0.750	0.688	1.000
Negative Predictive Value	0.920	0.971	0.945	1.000	1.000	0.907
Sensitivity +Specificity	1.903	1.903	1.625	1.963	1.898	1.545
Accuracy	0.950	0.950	0.950	0.967	0.917	0.917

For atrophy sensitivity of ultrasound came out to be 95.8%, specificity 94.4%, PPV 92%, NPV 97.1% and accuracy 95%. For endometrial hyperplasia sensitivity was 100%, specificity 89.8%, PPV 68.8%, NPV 100% and accuracy 91.7%. For carcinoma, sensitivity was 62.5%, specificity 100%, PPV 100%, NPV 94.5% and accuracy 95%. In detecting fibroid sensitivity, specificity, PPV, NPV and accuracy of ultrasound was 100%, 96.3%, 75%, 100% and 96.7%. Lastly, for the polyp sensitivity of ultrasound was 54.5%, specificity 100%, PPV 100%, NPV 90.7% and accuracy 91.7%.

IV. DISCUSSION

Sousa et al[8] (2001) found that (66.67%) of patients had ET > 4mm while 33.3% had ET ≤ 4mm. In the study conducted by Singh et al[9] (2016) 40% patients had ET ≤ 4mm while 60% had ET > 4mm. Junnare et al[10] (2019) also found ET ≤ 4 mm in 32% patients and ET > 4mm in 68%. In the present study, 43.33% patients had ET ≤ 4 mm and 56.67% of patients had ET > 4mm which is similar to study of Singh et al[9].

The present study 41.67% patients were found to have atrophic endometrium ultrasonographically, 26.67% patients had endometrial hyperplasia. Fibroid was detected in 13.33% patients while polyp was reported in 10% of the patients. 8.33% patients had carcinoma endometrium which is similar to study conducted by Solanki et al[11]

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