COMPARATIVE STUDY OF TRANSVAGINAL ULTRASOUND WITH HISTOPATHOLOGY IN DIAGNOSING ENDOMETRIAL PATHOLOGY IN POSTMENOPAUSAL BLEEDING

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ABSTRACT

BACKGROUND

Endometrial biopsy is considered the standard for detecting endometrial pathology, but since it is an invasive and blind procedure transvaginal ultrasound has been recommended as a less invasive substitute for detecting endometrial disease.

METHODS

This cross-sectional study was done in 100 patients to evaluate the efficacy of transvaginal ultrasound as a non-invasive investigative procedure for excluding endometrial pathology in patients with postmenopausal bleeding. All these patients underwent transvaginal sonography and dilatation and curettage.

RESULTS

In diagnosing endometrial pathology transvaginal sonography showed a sensitivity of 71.79%, specificity of 100%, positive predictive value of 100% and negative predictive value of 50%. A cut-off of 4mm endometrial thickness was taken for defining normality. No cases of endometrial malignancy were missed when 4mm was taken as the cut-off. The sensitivity of transvaginal sonography in detecting premalignant lesions was 75.76%, specificity was 82.35%, positive predictive value was 89.29% and negative predictive value was 63.64%.

CONCLUSION

The study concludes that transvaginal sonographic measurement of endometrial thickness can be used to exclude endometrial pathology in postmenopausal bleeding.

KEYWORDS

Dilatation And Curettage, Transvaginal Ultrasound, Endometrial Biopsy, Endometrial Thickness.

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INTRODUCTION

In the last three decades there has been an increase in the incidence of endometrial adenocarcinoma.¹ Incidence in India is 4.3/100000.² It is the most common gynaecological malignancy and fourth most common cancer in women in United States.³ In developing countries it is the second most common gynaecological malignancy with incidence of 5.9/100000.⁴ Overall about 2-3% of women develop endometrial cancer in their lifetime.³ In 85% cases postmenopausal women are affected.⁵ Peak incidence is between the sixth and seventh decade of life with the mean age of patients being 65yrs.⁶ Most cases (75%) are diagnosed very early (FIGO-STAGE 1) due to early episodes of abnormal uterine bleeding occurring in over 90% cases.⁷

Majority of post-menopausal vaginal bleeding is secondary to atrophic changes of endometrium or vagina.⁷

Only 10% patients with postmenopausal bleeding have endometrial carcinoma depending on age and other risk factors.⁷ The other causes of post-menopausal bleeding include endometrial atrophy (60-80%) in which vessels become fragile and breakup, endometrial polyps (2-12%), endometrial hyperplasia (5-10%).⁷

Curettage of uterine cavity under general anaesthesia is the gold standard for identifying endometrial pathology.¹ But considering the above mentioned figures, this examination is often unnecessary, expensive, invasive and involves considerable risks.¹ Two to ten percent false negative rates have also been reported, especially in cases with focal lesions.^{8,9,10} Transvaginal ultrasound with measurement of endometrial thickness exhibits good accuracy in differentiating normal and abnormal endometrium when compared with histological findings from uterine cavity.¹

The finding of endometrial thickness more than 4mm, a polypoidal endometrial mass requires further evaluation.⁷ Prospective study shows that an endometrial thickness less than 4mm in a post-menopausal woman with bleeding will have an incidence of endometrial carcinoma of only 1/10000.¹¹

Sonography may also identify abnormal structural changes in the endometrium. Cystic endometrial changes

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suggest polyps, homogeneously thickened endometrium may indicate hyperplasia and heterogeneous structural pattern is suspicious of malignancy.¹²

Hence, curettage could be avoided in post-menopausal women with bleeding and endometrial thickness less than 5mm and still not miss any endometrial cancer. This may reduce the number of D and C by 70%.¹³ This study plans to evaluate patients with postmenopausal bleeding using transvaginal sonography and fractional curettage. The study aims to determine whether transvaginal sonography can be used as a less invasive diagnostic tool instead of endometrial biopsy in post-menopausal bleeding.

MATERIALS AND METHODS

This is a cross-sectional study conducted in 100 consecutive patients with postmenopausal bleeding attending the out-patient clinic of the Department of OBG of a tertiary care medical college hospital. The study period was from August 2014 to May 2015. Convenient sampling technique was used. These patients were recruited into the study after written informed consent based on the following criteria- absence of menstrual bleeding for six months, abnormal uterine bleeding. All patients with use of hormone replacement therapy/Tamoxifen were excluded. The study was started after getting ethical approval from the institution ethics committee.

Transvaginal sonography was performed using Ultrasound scanner provided with 5MHz TVS probe. Endometrial thickness was taken in order to evaluate the extent to which it excluded the presence of endometrial lesions; 4mm endometrial thickness was taken as a cut-off for this. Multiple sagittal and transverse planes through the uterine fundus and lower segment were taken to find the thickest area. Sonographic criteria put forward by Fleischer and Colleagues.¹⁴ tell that endometrium appears at the center of the uterus as an hyperechoic structure or group of hyperechoic interfaces clearly separated from hypoechoic myometrium. Another important consideration taken was texture of the endometrium.

Atrophic endometrium will appear in ultrasound as a thin pencil like echogenicity surrounded by an intact hypoechoic halo. The normal endometrium has homogeneous echotexture and regular interface with myometrium. Vacuolation, non-homogeneous echotexture,² irregularity of endomyometrial interface indicate abnormality.¹⁵ When fluid was present in the uterine cavity, size of the anechoic area was subtracted from the total thickness. Patients with suboptimal visualization of endometrium were excluded from the study group. All patients underwent fractional curettage under general anaesthesia. The tissue obtained was sent for examination to the Department of Pathology.

Data was recorded and mean and standard deviations were calculated for demographic factors. The diagnostic accuracy of transvaginal sonography in excluding or identifying endometrial lesion was found by calculating

sensitivity, specificity, positive and negative predictive values each within its 95% confidence interval. The data was analysed using statistical package for social services version 20 for windows.

RESULTS

A total of 146 patients were screened for the study. Seventeen patients did not consent for the study and were excluded, a further 23 were excluded as they did not meet the inclusion criteria and 6 patients who received hormone replacement were also kept out. Thus the final study recruited 100 patients, Histopathological Examination (HPE) findings of the endometrium showed normal endometrium in 22% cases, 4% had benign lesions and 8% had endometrial polyps. Endometrial malignant and premalignant lesions accounted for 66% cases of postmenopausal bleeding (Table 1).

Histopathological Findings	Percentage
Normal Endometrium	22
Endometrial Benign Lesions	4
Endometrial Polyp	8
Premalignant Lesions	63
Malignant Lesions	3
Total	100

Table 1: Histopathological Examination (HPE) Findings

The comparison of histopathological findings with endometrial thickness assessed by TVS taking 4mm as the cut-off revealed that the diagnosis was accurate in 78 cases (22 true negative diagnoses and 56 true positive diagnoses). There were no false positives and false negatives were 22, but this did not include any case of endometrial adenocarcinoma. Sensitivity of TVS in diagnosing endometrial pathology is 71.79% and specificity was 100%. (Table 3) Positive predictive value was 100% and negative predictive value is 50%. (Table 2) Transvaginal sonography detected premalignant and malignant cases in 50 out of 66 cases; this included 3 cases of endometrial adenocarcinoma. There were 6 false positive cases and 16 false negative cases. Numbers of true negatives were 28. The sensitivity 75.76%, specificity was 82.35% with a positive predictive value 89.29% and negative predictive value 63.64% (Table 3).

HPE Findings	N	Less than or equal to 4mm	More than 4mm
Normal Endometrium	22	22	-
Endometrial Benign Lesions	4	2	2
Endometrial Polyp	8	4	4
Endometrial Premalignant Lesions	63	16	47
Malignant Lesions	3		3
Total	100	44	56

Table 2: HPE versus Transvaginal Sonographic assessment of Endometrial Thickness

Variable	Sensitivity %	Specificity %	+ve Predictive Value	-ve Predictive Value
Prediction of Endometrial Lesions	71.79%	100%	100%	50%
Prediction of Endometrial Premalignant and Malignant Lesions	75.76%	82.35%	89.29%	63.64%

Table 3: Diagnostic Accuracy of TVS assessment of Endometrial Thickness

DISCUSSION

Endometrial curetting or sampling is considered the gold standard for evaluating patients with postmenopausal bleeding. Transvaginal sonographic measurement of endometrial thickness is being used by various investigators as an ideal non-invasive technique in postmenopausal bleeding to identify patients who need further invasive diagnostic procedures. But transvaginal sonography cannot differentiate between hyperplasia, endometrial polyps and malignant lesions.^{16,17} some studies shows a difference in sensitivity of 8.9% between sonographic and histological diagnosis of endometrial carcinoma.^{16,18}

In our study group, no cases of endometrial carcinoma were missed by transvaginal sonography when 4mm was taken as the cut-off. In a study by Doruman and Colleagues when the cut-off was taken as 5mm, 3 endometrial malignancies were missed out of 15 identified by endometrial sampling.¹⁹ In our study group, post-menopausal bleeding was not due to any endometrial pathology in 22% cases. All these cases were correctly identified by Transvaginal sonography. These patients were unnecessarily submitted to D and C. Despite the high specificity (100%) in excluding endometrial pathology the sensitivity was 71.79%. The relatively low sensitivity is due to high false negative values and which included 16 cases of endometrial hyperplasia without atypia.

CONCLUSION

These results show that transvaginal sonography is an efficient, non-invasive method to exclude endometrial pathology. No case of endometrial carcinoma was missed when 4mm was taken as the cut-off. Our study like other previous studies emphasizes the role of measuring endometrial thickness by transvaginal sonography in all cases of postmenopausal bleeding thereby limiting the use of invasive procedures.

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