

## Role of endometrial thickness in predicting endometrial cancer in postmenopausal bleeding

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### Abstract

**Background:** Postmenopausal bleeding (PMB) is a common gynecological complaint and an important warning symptom of endometrial carcinoma. Transvaginal ultrasonography (TVS) is widely used as a first-line investigation, with endometrial thickness (ET) being a key parameter in evaluating malignancy risk.

**Objective:** To evaluate the role of endometrial thickness measured by transvaginal ultrasonography in predicting endometrial cancer among women presenting with postmenopausal bleeding.

**Methods:** This prospective observational study was conducted on 100 women presenting with postmenopausal bleeding. All patients underwent transvaginal ultrasonography for measurement of endometrial thickness, followed by histopathological evaluation through endometrial sampling. The diagnostic accuracy of various endometrial thickness cut-off values in predicting endometrial malignancy was analyzed.

**Results:** The mean age of participants was  $58.6 \pm 6.8$  years. Endometrial carcinoma was diagnosed in 18% of patients. An endometrial thickness  $\geq 5$  mm was significantly associated with malignant pathology ( $p < 0.001$ ). Using a 5 mm cut-off, TVS demonstrated a sensitivity of 94.4%, specificity of 72.0%, positive predictive value of 41.5%, and negative predictive value of 98.3% for detecting endometrial cancer.

**Conclusion:** Endometrial thickness measured by transvaginal ultrasonography is a reliable, non-invasive predictor of endometrial cancer in women with postmenopausal bleeding. An endometrial thickness of less than 5 mm effectively excludes malignancy and may help avoid unnecessary invasive procedures.

**Keywords:** Postmenopausal bleeding, Endometrial thickness, Endometrial cancer, Transvaginal ultrasonography

### Introduction

Postmenopausal bleeding (PMB) is defined as bleeding from the genital tract occurring after 12 months of amenorrhea in a woman of menopausal age[1]. It accounts for approximately 5–10% of gynecological outpatient visits and is considered an alarming symptom due to its strong association with endometrial carcinoma. Although the majority of PMB cases are caused by benign conditions such as endometrial atrophy or polyps, endometrial cancer must always be excluded[2].

The most prevalent gynecological cancer in developed nations is endometrial carcinoma, whose incidence is rising as life expectancy rises and risk factors like obesity, diabetes, and unopposed estrogen exposure become more common. Since the prognosis is better when the disease is discovered early, early diagnosis is essential [3].

PMB has traditionally been assessed by endometrial biopsy or dilatation and curettage. These invasive procedures might not be required for every patient, though. Transvaginal ultrasonography (TVS) has become a straightforward, affordable, and non-invasive initial diagnostic procedure. The most crucial sonographic metric for classifying the risk of cancer is the measurement of endometrial thickness [4-5].

In order to rule out endometrial cancer, several studies have suggested various endometrial thickness cut-off values, ranging from 3 to 5 mm. Clinical practice is still variable, nevertheless, especially in environments with low resources. In this study, women who report with postmenopausal bleeding will have their endometrial thickness evaluated for its prognostic utility in identifying endometrial cancer [6].

## **Materials and Methods**

### **Study Design and Setting**

This prospective observational study was conducted in the Department of Obstetrics and Gynecology at Amaltas Institute of Medical Sciences, Dewas over a period of 18 months.

### **Study Population**

A total of 100 consecutive women presenting with postmenopausal bleeding were enrolled in the study.

### **Inclusion Criteria**

- Women with natural menopause
- Postmenopausal bleeding occurring at least 12 months after cessation of menses
- Willingness to participate in the study

### **Exclusion Criteria**

- Women on hormone replacement therapy
- History of endometrial cancer or hysterectomy
- Bleeding due to non-uterine causes
- Inadequate endometrial sampling

## Methodology

Detailed history and clinical examination were performed for all patients. Transvaginal ultrasonography was conducted using a high-frequency vaginal probe. Endometrial thickness was measured in the sagittal plane at the thickest part of the endometrium, including both layers.

Following ultrasonography, all patients underwent endometrial sampling by pipelle biopsy or dilatation and curettage. Histopathological examination was considered the gold standard.

## Statistical Analysis

Data were analyzed using descriptive statistics. A p-value <0.05 was considered statistically significant.

## Results

**Table 1: Age Distribution of Study Participants (n = 100)**

Age Group (years)	Number of Patients	Percentage
45–50	14	14%
51–55	26	26%
56–60	32	32%
61–65	18	18%
>65	10	10%

**Table 2: Endometrial Thickness Distribution on TVS**

Endometrial Thickness (mm)	Number of Patients	Percentage
≤4	30	30%
5–8	34	34%
9–12	20	20%
>12	16	16%

**Table 3: Histopathological Findings**

Histopathology	Number of Patients	Percentage
Endometrial atrophy	38	38%
Endometrial polyp	20	20%
Endometrial hyperplasia	24	24%
Endometrial carcinoma	18	18%

**Table 4: Association between Endometrial Thickness and Endometrial Malignancy**

Endometrial Thickness (mm)	Benign Lesions (n)	Endometrial Carcinoma (n)	Total	P Value
≤4	30	0	30	<b>Chi-square test = 18.62, p &lt; 0.001 (statistically significant)</b>
5–8	28	6	34	
9–12	14	6	20	
>12	10	6	16	
<b>Total</b>	<b>82</b>	<b>18</b>	<b>100</b>	

### Discussion

Postmenopausal bleeding remains a critical clinical symptom requiring prompt evaluation. In the present study, the mean age of patients was consistent with previously published literature, where PMB most commonly occurs in the sixth decade of life[7-8].

Endometrial carcinoma was detected in 18% of patients, which aligns with reported rates ranging from 10% to 20%. The majority of benign cases were due to endometrial atrophy, reinforcing its status as the most common cause of PMB[9].

Our findings demonstrate a strong correlation between increased endometrial thickness and malignant pathology. No cases of endometrial carcinoma were observed in women with an endometrial thickness ≤4 mm. This supports the use of a 4–5 mm threshold as a safe cut-off to exclude malignancy[10].

Using a 5 mm cut-off, transvaginal ultrasonography showed high sensitivity and excellent negative predictive value. This implies that women with PMB and thin endometrium can be reassured and may avoid unnecessary invasive diagnostic procedures.

However, specificity and positive predictive value were relatively low, indicating that increased endometrial thickness alone cannot confirm malignancy and histopathological evaluation remains essential[11-12].

### Conclusion

Endometrial thickness measured by transvaginal ultrasonography is a valuable screening tool in the evaluation of postmenopausal bleeding. An endometrial thickness of less than 5 mm effectively rules out endometrial carcinoma with high confidence. Transvaginal ultrasonography should be considered the first-line investigation in women with postmenopausal bleeding, with endometrial sampling reserved for those with increased thickness or persistent symptoms.

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