

Determination of Endometrial Thickness Threshold for Prompt Biopsy in Postmenopausal Women Without Vaginal Bleeding

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ABSTRACT:

BACKGROUND:

Transvaginal sonography is performed as part of a pelvic sonogram in postmenopausal women and images of the endometrium are frequently obtained. In asymptomatic postmenopausal women without vaginal bleeding, the threshold separating normal from abnormally thickened endometrium is not known.

OBJECTIVE:

To determine an endometrial thickness threshold using transvaginal sonography for prediction of endometrial cancer in postmenopausal women without vaginal bleeding (asymptomatic).

METHOD:

The study group includes 100 asymptomatic postmenopausal women without vaginal bleeding. We measure the sensitivity and specificity of transvaginal sonography in the prediction of cancer in asymptomatic postmenopausal women without vaginal bleeding at endometrial thickness ≤ 5 mm, 5-10 mm & >10 mm.

RESULTS:

Four cases (4) of cancer were detected at >10 mm endometrial thickness. In asymptomatic postmenopausal women without vaginal bleeding the sensitivity 100%, specificity 47.91%, positive predictive values 7.40% and negative predictive values 100% at 10mm endometrial thickness while at 5mm endometrial thickness, the sensitivity 100%, specificity 9.3%, positive predictive values 4% and negative predictive values 100%.

CONCLUSION:

In asymptomatic postmenopausal women promotion for endometrial sampling if endometrial thickness >10 mm seen by transvaginal sonography give better positive predictive value, sensitivity & specificity than >5 mm endometrial thickness.

KEYWORDS: postmenopausal women; endometrial cancer; incidental findings; screening; transvaginal ultrasound

INTRODUCTION:

The postmenopausal uterus is generally smaller than the premenopausal uterus and the endometrium has a maximum thickness of <5 mm^(1,2).

Endometrial cancer is the most common malignancy of the female genital tract accounting for almost one half of all gynecological cancer in United States. It is the 4th most common cancer and the 7th or 8th leading cause of death from malignancy and the 3rd most common cause of gynecological cancer death "behind ovarian and cervical cancer"^(3,4).

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TVS is a noninvasive means of evaluating the endometrium. It is well tolerated, generally painless, relatively low-cost technique which can be easily performed & without complication^(5,6). TVS as well as being able to visualize the endometrium in its entirety in most women; it also allows the detection of focal endometrial pathology which may be missed by blind biopsy techniques. It has a complementary role in excluding ovarian pathology⁽⁷⁾. The mean endometrial thickness in postmenopausal women is much thinner than in premenopausal women. The thicker the endometrium the higher the likelihood of significant pathology (e.g. endometrial cancer) being present⁽⁸⁾.

DETERMINATION OF ENDOMETRIAL THICKNESS

PATIENTS & METHODS:

The study group includes 100 postmenopausal women collected from outpatient departments (Gynecological & medical departments) & Private clinics.

From the whole 100 asymptomatic postmenopausal women omit acceptance to the procedures obtained after explaining to them the method and the purpose of the study. A thorough gynecological & medical history was taken. Data collected includes age of patient, parity, age of menopause and age of menarche. Any relevant personal or family history of malignancy was recorded. All patients were submitted to general physical & gynecological examination. All were under went a TVS examination & endometrial thickness threshold were calculated.

In the gynecological department TVS were taken & endometrial thickness were measured as the thickest part in the longitudinal plane and measurement include both layers "double layer" using a 7.5 MHz transvaginal electronic sector. Transducer with central frequency of MHz.

We estimated the predictive value of cancer associated with a thickened endometrium in women without vaginal bleeding that result in a similar prediction of cancer & the sensitivity and specificity of TVS.

Endometrial biopsies were taken from the whole 100 postmenopausal women, thirty women by Sherman Curette & the rest by Dilatation & Curettage under general anesthesia. The whole cases of cancer.

results were sent for histopathological study.

Statistical Analysis:-

Endometrial thickness threshold we calculated the predictive value of cancer for women with an endometrial thickness ≤ 5 mm, 5-10mm & > 10 mm in asymptomatic postmenopausal women.

At endometrial thickness for women ≤ 5 mm, ≤ 10 mm, the risk of cancer were determined through:

$$PPV = (1-NPV) = \frac{Fn(1-sensitivity)}{FN + TN}$$

At endometrial thickness for women > 5 mm, > 10 mm, the risk of cancer were determined through:

$$PPV = \frac{TP}{TP + FP}$$

- Estimation of the PPV, NPV.
- Estimation of the sensitivity & specificity of TVS.
- The results were expressed as mean \pm SD or as percentage.
- The significant difference using t-test for two-independent means.
- The significant difference using Pearson chi-squared test.

RESULTS:

As shown in table (1) from the total collected 100 asymptomatic postmenopausal women, endometrial thickness at ≤ 5 mm, 5-10mm, > 10 mm by transvaginal ultrasound were measured, we diagnose only 4

Table 1: Relation between ultrasound endometrial thickness and cancer incidence in asymptomatic postmenopausal women.

		CANCER		
		no	Yes	Total
Endometrial thickness	≤ 5	9	0	9
	>5-10	37	0	37
	> 10	50	4	54
	Total	96	4	100

DETERMINATION OF ENDOMETRIAL THICKNESS

At endometrial thickness $>10\text{mm}$, positive predictive value (PPV)= 7.40%, negative predictive value (NPV) =100%, sensitivity =100% & specificity =47.91% .While at endometrial

thickness $\leq 10\text{mm}$ from total forty six women " true negative (TN)= 46 & false negative (FN)=0" while for those with an endometrial thickness $>10\text{mm}$, "FP =50 & TP= 4", as shown in table(2).

Table 2: TVS endometrial thickness at 10mm in asymptomatic postmenopausal women sensitivity, specificity ,PPV&NPV .

Endometrial thickness		CANCER		Total
		no	yes	
Endometrial thickness	≤ 10	46 (TN)	0 (FN)	46
	>10	50 (FP)	4 (TP)	54
	Total	96	4	100

sensitivity	100%
specificity	47.91%
PPV	7.40%
NPV	100%

At endometrial thickness $>5\text{mm}$, positive predictive value (PPV) = 4%, negative predictive value (NPV)= 100%, sensitivity =100% & specificity = 9.3% while at endometrial thickness $\leq 5\text{mm}$ from total forty six women "true negative

(TN)= 9 & false negative (FN) =0 " while for those with an endometrial thickness $>5\text{mm}$, " false positive (FP) =87 & true positive (TP)= 4", as shown in table (3)

Table 3: TVS endometrial thickness at 5mm in asymptomatic postmenopausal women "without vaginal bleeding", sensitivity, specificity, PPV&NPV .

		CANCER		Total
		no	yes	
Endometrial thickness	≤ 5	9 (TN)	0 (FN)	9
	>5	87 (FP)	4 (TP)	91
	Total	96	4	100

Sensitivity	100 %
Specificity	9.3 %
PPV	4 %
NPV	100 %

DISCUSSION:

The interpretation and clinical management of an incidentally noted thick endometrium has not been standardized⁽⁹⁾ . Endometrial cancer is usually associated with vaginal bleeding and the risk of cancer is very low in women without

bleeding. Therefore, in asymptomatic women the index of suspicion for underlying cancer should be extremely high to warrant an invasive endometrial biopsy on the basis of imaging findings alone. In the current study, only four

DETERMINATION OF ENDOMETRIAL THICKNESS

cases of cancer were detected from the whole 100 asymptomatic postmenopausal women.

In our current study, an endometrial thickness >10mm carries a predictive value for cancer by TVS positive predictive value (PPV)= 7.40%, negative predictive value (NPV)=100%, sensitivity =100% & specificity =47.91%.approximately 7.40%, while at endometrial thickness >5mm, positive predictive value (PPV) = 4%, negative predictive value (NPV)= 100%, sensitivity =100% & specificity = 9.3%, this suggests that endometrial thickness at 10mm has better PPV & specificity than TVS at 5mm endometrial thickness for asymptomatic postmenopausal women, while in a retrospective study done in 2009 by M. Gambacciani et al of 850 asymptomatic postmenopausal women, the mean endometrial thickness was 10.7±1.4mm (range:7-16mm) & total false positive rate was 93.2% & positive predictive value was 0.7%⁽¹⁰⁾. In a cohort study done in 2004 by Smith Bindman et al of 100000 of both symptomatic & asymptomatic postmenopausal women, an endometrial thickness >11mm in asymptomatic postmenopausal women carries a risk of cancer of approximately 6.7% is similar to that of symptomatic postmenopausal women at an endometrial thickness > 5mm, conversely the risk of cancer is quite low among asymptomatic women whose endometrial thickness measures ≤ 11mm⁽¹²⁾.

In a cohort study made by John P. Langlois, MD et al, of 448 asymptomatic postmenopausal women where included & conclude that TVS has poor predictive value but a high negative predictive value for detecting serious endometrial disease at 5mm threshold for endometrial thickness⁽¹³⁾.

In a prospective study done in 2009 done by Myrvete Pacarada et al of 150 asymptomatic postmenopausal women, an endometrial thickness of 10mm was always associated with only histological pathology⁽¹¹⁾.

Several authors all confirm that no cut-off is perfect, and cancer will be missed no matter what cut-off is used. However, using a cut-off of 10 or 11 mm seems to provide an acceptable trade-off between cancer detection and unnecessary biopsies prompted by an incidental finding⁽¹³⁾.

A woman with known risk factors for endometrial cancer (such as diabetes or age >70

years) will have a higher risk of cancer than one without such risk factors, even with the same endometrial thickness measurement. Thus, it is important to take into account individual patient risk when deciding how to manage imaging findings⁽¹⁴⁾.

On the current study we concentrate only on endometrial thickness and no other components of endometrial appearance such as homogeneity, nodularity and Doppler flow characteristics because of insufficient use of data to determine how they should be used in screening for endometrial cancer. We took an endometrial thickness 10mm as a conservative threshold since hormone therapy will, if anything, tend to increase it as it will lead to additional, rather than fewer, biopsies. While we believe these data can be generalized, it is possible that these women may have systematic differences in their endometrial thickness compared with women who might not have been included.

CONCLUSION:

In asymptomatic postmenopausal women promotion for endometrial sampling if endometrial thickness >10mm seen by transvaginal sonography give better positive predictive value, sensitivity & specificity than >5mm endometrial thickness.

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DETERMINATION OF ENDOMETRIAL THICKNESS

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DETERMINATION OF ENDOMETRIAL THICKNESS
