Postmenopausal endometrial cancer screening: is there a correlation between transvaginal sonographic measurement of endometrial thickness and body mass index?

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Summary

Objective: The aim of this study was to correlate the body mass index with transvaginal sonographic measurement of endometrial thickness in a cohort of postmenopausal women who were admitted for endometrial cancer surveillance.

Material and Methods: Transvaginal sonographic measurement of endometrial thickness was performed in 97 postmenopausal women who attended the gynecology clinic for endometrial cancer screening with no history of hormone replacement therapy and correlated with body mass index. Baseline characteristics including age, years since menopause and body mass index were recorded for each subject. The relationship between transvaginal sonographic endometrial thickness and baseline characteristics was assessed in each.

Results: Body mass index was significantly correlated with years since menopause ($r = 0.292$, $p = 0.004$) and age ($r = 0.243$, $p = 0.01$) but not with endometrial thickness ($r = -0.07$, $p = 0.454$). Endometrial thickness versus time since menopause correlation was found to be significant ($r = 0.274$, $p = 0.03$) in patients with a body mass index lower than 30.

Conclusion: The present findings indicate that endometrial thickness does not differ with body mass index in the screening of postmenopausal women for endometrial cancer.

Key words: Transvaginal sonography; Body mass index; Endometrial thickness.

Introduction

It has been demonstrated that the risk of developing endometrial cancer is associated with increased endometrial thickness [1, 2]. Endometrial thickness is correlated with serum estradiol in premenopausal women [3, 4]. In postmenopausal women, circulating estradiol originates from aromatization of estrone in adipose tissue which increases with age and body weight and is the major conversion site of androstenedione to estrone [5-7]. Obesity may then cause an excess of circulating estradiol which in turn may stimulate the endometrium and increase transvaginal sonographic endometrial thickness.

The aim of the present study was to find out the statistical correlation between the body mass index and transvaginal sonographic measurement of endometrial thickness in postmenopausal women who are screened for endometrial cancer.

Materials and Methods

The study was comprised of 97 postmenopausal women who were screened for endometrial cancer at our gynecology clinics, Kahramanmaras Sutcuimam, Malatya Inonu and Mersin University, Medical Faculty, Department of Obstetrics and Gynecology, during the years 2001 and 2002. The patients had experienced no menstruation for at least 12 months prior to the investigation. Women using hormone replacement therapy (HRT) for climacteric symptoms were excluded from the study group. Patients were admitted for endometrial cancer surveillance. All patients chosen for the study group underwent dilatation and curettage (D&C) under general anesthesia and had pathological results which revealed atrophic endometrium ($n = 71$) and proliferative endometrium ($n = 26$). The following histological diagnoses were considered pathological: endometrial polyps, endometrial hyperplasia, and endometrial cancer. The results were retrospectively evaluated and the Local Ethics Committee stated that retrospective studies did not need approval to be considered.

Transvaginal sonographic measurement of endometrial thickness was performed in 97 postmenopausal women who were admitted for endometrial cancer surveillance and correlated with body mass index. Baseline characteristics including age, years since menopause and body mass index (BMI) were recorded for each subject. BMI was calculated as weight/height^2 (kg/m^2 in units).

Transvaginal sonographic examinations were all performed with the use of a ALOKA 4000 Prosound Model (Aloka Co., Ltd., Tokyo), EUB 420 (Hitachi, Japan), ATL3500 (USA) and Logiq 500 (General Electric, USA) machines with 5.0-6.5 MHz frequency vaginal probes. Transvaginal sonography was performed with an empty bladder. Endometrial thickness (two-layer) was measured by experienced gynecologists in the sagittal views and the distance was assessed between the two basal layers of the anterior and posterior uterine wall at the thickest point.

Revised manuscript accepted for publication November 10, 2003

The statistical analysis was performed using a commercially available statistics program (SPSS, USA). The relationship between transvaginal sonographic endometrial thickness and baseline characteristics was assessed with Pearson correlation analysis; a p value lower than 0.05 was accepted as significant.

Results

The demographic variables of the study patients are shown in Table 1. Body mass index was significantly correlated with years since menopause (r = 0.292, p = 0.004) and age (r = 0.243, p = 0.01) but not with endometrial thickness (r = -0.07, p = 0.454). Endometrial thickness versus time since menopause was found to be statistically significant (r = 0.274, p = 0.03) in patients with a body mass index lower than 30. The correlation with regard to body mass index was lower or equal to 30 and higher than 30 (Table 2).

Table 1. — *Demographic variables of the study patients.*

	Mean	Standard deviation
Age	50.8	5.7
Time since menopause	5.09	6.01
Body mass index	29.5	4.8
Endometrial thickness	5.7	3.7

Table 2. — *Findings when patients were selected with respect to body mass index.*

	Body mass index lower or equal to 30 (n = 61)	Body mass index higher than 30 (n = 36)
Endometrial thickness (mm)	6.2 ± 4.08	5.02 ± 3.09
Time since menopause (years)	3.7 ± 4.3	7.4 ± 7.5
Endometrial thickness Versus body mass index correlation	r = 0.061 p = 0.64	r = 0.136 p = 04.28
Endometrial thickness Versus time since menopause correlation	r = 0.136 p = 0.03	r = -0.167 p = 0.331

*Statistically significant.

Discussion

There have been many speculations with regard to the relationship between BMI and sonographic endometrial thickness in postmenopausal women [9, 11]. High body mass index and abdominal fat distribution correlate with increased endometrial thickness and bone mass [8]. Andolf *et al.* [9] studied the prevalence and significance of an endometrial thickness of 5 mm or greater measured by ultrasound in 300 asymptomatic postmenopausal women without vaginal bleeding. When the endometrium was 5 mm thick or greater, ultrasound was repeated every third month. In women with endometrium measuring less than 5 mm, the endometrial thickness correlated to body weight. The endometrium measured 5 mm or more in 22 women, who were followed with ultrasound for 1-25 months. Body weight and body mass index (BMI) were higher in women with a thick endometrium. Serum levels of estrone, estradiol, FSH, and LH differed from those in women with normal sonographic findings.

The measurements of endometrial thickness in patients presenting with postmenopausal bleeding can be repeated quite accurately up to a level of 4 mm thickness [9]. In a similar study conducted by Douchi *et al.* [10] 212 postmenopausal women with histologically proven normal endometrium and with endometrial thickness more than 1.0 mm were studied. In contrast to the present study, body mass index was significantly correlated with endometrial thickness (r = 0.40, p < 0.001), but age and years since menopause were not correlated. On stepwise regression analysis only BMI was still associated with endometrial thickness (R2 = 0.16, p < 0.001).

Although we did not make any correction for age in the statistical analysis, the present study agrees with the report by Bosch *et al.* [11] who studied 167 asymptomatic postmenopausal women and found that obesity was not correlated to endometrial thickness when adjusted for age.

In the present study, body mass index was significantly correlated with years since menopause (r = 0.292, p = 0.004) and age (r = 0.243, p = 0.01) but not with endometrial thickness (r = -0.07, p = 0.454). Endometrial thickness versus time since menopause was found to be statistically significant (r = 0.274, p = 0.03) in patients with a body mass index lower than 30.

Gull *et al.* [12] studied the factors associated with endometrial thickness and uterine size in a random sample of postmenopausal women. The current use of hormone replacement therapy was the most important factor associated with both endometrial thickness and uterine size parameters.

In conclusion the present findings indicate that endometrial thickness did not differ with body mass index in postmenopausal women who were screened by transvaginal sonographic endometrial thickness measurement for endometrial cancer screening.

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