

## COMPARATIVE STUDY OF TRANSVAGINAL HYSTEROSONOGRAPHY AND BIOPSY FOR THE EVALUATION OF POST-MENOPAUSAL BLEEDING

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**Background:** The aim of this prospective study was to evaluate transvaginal hysterosonography (TVHS) in post-menopausal bleeding (PMB) as an alternative to endometrial biopsy. The study was conducted at the Zarka Military Hospital, Amman, Jordan, over a one-year period from 1996 to 1997.

**Patients and Methods:** The study comprised 98 women presenting with post-menopausal bleeding who had been listed for diagnostic dilatation and curettage. Transvaginal sonography (TVS) and transvaginal hysterosonography were performed one week before operation. The mean age of the women was 57 years, and all of them had had their menopause for at least six months.

**Results:** Sixty-one women (62%) demonstrated endometrial thickness of more than 5 mm by transvaginal sonography. All the women had transvaginal hysterosonography, except seven on whom hysterosonography could not be performed for technical reasons and who had to be excluded from the study, leaving a total of 54 women. TVS confirmed the presence of endoluminal mass in 30 of 54 women (60%). Twenty-two of the 30 endoluminal mass cases were pedunculated while eight were sessile. Sixteen of the pedunculated cases were endometrial polyps while the remaining six were fibroid polyps. Five of the sessile cases were fibroid, two were endometrial hyperplasia, and the last one endometrial carcinoma. The other 44 out of the 98 patients also underwent transvaginal hysterosonography. No pathology could be detected in these patients, but they were noted to have atrophic endometrium after dilatation and curettage.

**Conclusion:** The combination of transvaginal sonography and transvaginal hysterosonography is both sensitive and specific with regard to detecting and excluding endoluminal masses as the cause of post-menopausal bleeding. Diagnostic dilatation and curettage fails to detect a large percentage of some lesions, so TVS in combination with TVHS should be considered as the initial examination in the evaluation of all women with post-menopausal bleeding.

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**Key Words:** Transvaginal sonography, transvaginal hysterosonography, dilatation and curettage.

Hysterosonography involves instillation of sterile saline under continuous sonographic visualization to assess the endometrial cavity.<sup>1</sup> It was first described in 1984 by Richman et al.,<sup>2</sup> who had used it with transabdominal techniques for determining tubal patency. Transabdominal sonography demonstrated bilateral tubal occlusion with a reported sensitivity of 100%, and tubal patency with a reported specificity of 96%. Transvaginal sonography (TVS) is currently the imaging method of choice for evaluating the endometrium in women with post-menopausal bleeding (PMB).<sup>3-10</sup> In these women, a thickening of the endometrium exceeding 5 mm indicates the presence of pathologic endometrial lesions (a sensitivity of 97% for detecting a carcinoma).<sup>5-10</sup> Biopsies

of endometria of less than 5 mm thick are nearly always negative or result in tissue insufficient for diagnosis,<sup>11</sup> however, endometrial thickening is a nonspecific finding that can be due to hyperplasia, polyps, fibroids (intraluminal or submucosal), and carcinoma.<sup>11</sup> Several recent reports have indicated that transvaginal hysterosonography (TVHS) can improve the specificity of transvaginal sonography (TVS) in differentiating endoluminal masses from more diffuse endometrial thickening.<sup>11-17</sup>

Despite numerous publications advocating the use of TVS and TVHS in evaluating women with post-menopausal bleeding, many physicians still consider endometrial biopsy (EMB) to be the standard of care when screening for endometrial diseases.<sup>20</sup> To address this issue, we prospectively performed 98 TVHS examinations one week before dilatation and curettage (D&C) operation in patients referred for PMB. All women with positive TVHS examination then underwent hysteroscopy or hysterectomy.

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### Patients and Methods

From 1 January 1996 to 31 December 1997, a total of 98 women underwent TVS for the evaluation of postmenopausal bleeding (PMB), before having an endometrial biopsy (EMB). The patients ranged in age from 40 to 80 years (mean, 57 years). All had been postmenopausal for at least six months, and hormonal therapy had failed in all of them. All biopsies were performed in the Gynecology Department, using dilatation and curettage (D&C).

In 54 of these patients, initial TVS showed endometrial thickening of 5 mm or more, and these patients underwent TVHS after giving informed consent. Seven patients were excluded from the study, who could not undergo TVHS due to stenosed cervix. All patients undergoing TVHS were listed for D&C one week after TVHS. All patients with positive TVHS then underwent hysteroscopy/hysterectomy. Those with negative TVHS examination were followed clinically.

The patients were examined with commercially available equipment (Acuson-XP128, Mountain View, CA, and Philips 701 Santa Ara, CA), with 5 mhz and multifrequency (3.5, 5.0, 7.4 mhz) transvaginal probes. Sagittal and coronal TVS images of the uterus were obtained in all patients. Double-layer endometrial thickness was determined on a mid-sagittal view, according to the method of Fleischer et al.<sup>18</sup>

TVHS was performed by placing the patient in the dorsal lithotomy position, and placing a speculum into the vagina to expose the cervix. The external os was cleansed with povidon-iodine (Betadine). A 6.7 F balloon or 95.0 F non-balloon catheter was then advanced into the cervical canal. The transvaginal probe was inserted and approximately 10 mL of sterile saline solution was injected slowly through the catheter under direct sonographic visualization. Multiple sagittal and coronal images were then obtained.

### Results

In 61 of the 98 women (55%), initial TVS demonstrated endometrial thickness greater than 5 mm. All of these women then had TVHS, except seven who were excluded from the study because TVHS could not be performed due to a stenosed cervix. TVHS confirmed the presence of an endoluminal mass in 30 (55%) of the 54 women and excluded it in 24 (44%).

Twenty-two of the 30 endoluminal mass cases were pedunculated and eight were sessile. Sixteen of the 22 pedunculated lesions were homogenous, and demonstrated no interruption of the endometrial lining. These were found to be endometrial polyps (Figure 1). The remaining six pedunculated masses were inhomogenous and interrupted the endometrial lining. These were shown to be fibroids. Of the eight sessile masses found at TVHS, five were fibroids, two were focal areas of hyperplasia, and one

was endometrial carcinoma. The remaining 44 (45%) of the 98 patients also underwent transvaginal hysterosonography. No pathology could be detected in these patients, but they were noted to have atrophic endometrium after dilatation and curettage.

One (1%) patient in this series developed symptoms consistent with mild endometritis, and was treated successfully with oral doxycycline (100 mg bid). There were no other complications. Twenty-eight of the 30 women (93%) with endoluminal masses seen on TVHS had false-negative D&C results. One patient had carcinoma which was detected by TVHS and confirmed by pathology. The result obtained from D&C was hyperplasia. All 44 women with negative TVHS examinations had negative biopsy results.

### Discussion

The prevalence of postmenopausal bleeding (PMB) is estimated to be 5% of gynecologic visits, and is rising owing to the increasing use of hormone replacement therapy.<sup>19</sup> Exogenous estrogens are the etiologic factor in 30% of cases of PMB, whereas atrophic endometritis or vaginitis is responsible for another 30% of cases. The remaining 40% of the cases of PMB are due to endometrial hyperplasia (10%), endometrial polyps (10%), submucosal fibromas (10%), and uterine malignancies (10%). Most of the cancers responsible for PMB are endometrial in origin, accounting for 5% to 8% of all cases of PMB.<sup>19</sup>

Dilatation and curettage (D&C) is currently the initial diagnostic procedure in the evaluation of PMB in our institution. All women with PMB are placed on hormone replacement therapy and undergo D&C. Replacement therapy had failed in all patients referred for TVS. Recent studies indicate that D&C can identify 80% to 85% of cases of endometrial cancer, but other investigators have indicated a lower sensitivity.<sup>20</sup> However, D&C may miss many endometrial lesions, as it is performed blindly, and samples only a small portion of the total endometrial surface. In addition, pedunculated lesions can move away from the biopsy instrument, and incipient polyps may not be identified if the basal layer of the endometrium is not included in the specimen.<sup>21</sup> The endometrium overlying sessile lesions, such as submucous fibromyomas, is usually normal.<sup>16</sup> Our results indicate that D&C failed to detect the pathologic process responsible for PMB in 30 of the 98 cases (30.6%). Also, D&C missed one carcinoma (1%) in our series.

When D&C is used as the "gold standard" for diagnosing pathologic endometrial lesions in women with PMB, about 10% have an endometrial cancer and an additional 20% have some other endometrial abnormality. Other abnormalities, such as endometrial polyps and submucous fibroids, are difficult to diagnose by D&C.<sup>22</sup> In addition, many patients with PMB whose initial endometrial biopsy or D&C results reveal benign or

insufficient tissue may eventually be diagnosed as having endometrial cancer or complex endometrial hyperplasia.<sup>23</sup> Numerous recent investigations<sup>5-11</sup> indicate that TVS is an effective procedure to exclude endometrial and intrauterine abnormalities, and advocate its use as a routine first-step procedure in patients with abnormal uterine bleeding. The prevalence of endometrial carcinoma is higher in women in whom the endometrium is thicker than 5 mm.<sup>5</sup> TVS can, therefore, be used to determine which patients should undergo further investigation.

Recent reports have demonstrated that filling the endometrial cavity with fluid allows improved detection and delineation of small endoluminal masses.<sup>24</sup>

Our study shows that the addition of TVHS to TVS allows the detection of pathologic endometrial lesions in many cases of PMB. The combination of TVS and TVHS may be used as the first diagnostic step in the investigation of women with PMB. D&C can be used in patients with thickened endometrium in whom TVHS cannot be performed because of technical factors (approximately 7% in our series). The technique of TVHS is simple to perform and relatively painless. Some patients complain of minor cramping during the saline instillation.

The major risks of performing TVHS are infection and perforation. In our series, one patient developed mild endometritis after the procedure. The patient had a history of pelvic infection and, therefore, was at a higher risk for developing endometritis.

Hysteroscopy is an accurate method for diagnosing and treating endometrial abnormalities, however, its invasive nature and high cost preclude its use as a primary diagnostic procedure in patients with PMB.

The cost of performing and interpreting the result of a D&C is comparable to that for TVS. The additional cost of TVHS seems justified in view of the added information it provides. This information can decrease the total cost of care for these patients by allowing more definitive treatment options.

The combination of TVS and TVHS is appropriate, with regards to detecting and excluding endoluminal masses as the cause of PMB. D&C by itself fails to detect a large percentage of such lesions, and we believe that the combination of TVS and TVHS should be considered as the initial examination in the evaluation of all women with PMB.

## References

- Cullinan JA, Fleischer AC, Kepple DM, Arnold A. Sonohysterography: a technique for endometrial evaluation. *Radiographics* 1995;15:501-14.
- Richman TS, VisComi GN, Decherney A, Polau ML, Alcebo LO. Fallopian tubal patency assessed by ultrasound following fluids injection. *Radiology* 1984;152:507-10.
- Goldstein SR, Nachtigall M, Snyder JR. Endometrial assessment by vaginal ultrasonography before endometrial sampling in patients with post-menopausal bleeding. *Am J Obstet Gynecol* 1990;136:119.
- Mendelson FB, Bohm-Velez M, Joseph N. Endometrial abnormalities: evaluation with transvaginal sonography. *Am J Radiol* 1988;150:139.
- Nasri MN, Coast GJ. Correlation of ultrasound findings and endometrial histopathology in post-menopausal women. *Br J Obstet Gynaecol* 1989;96:1333.
- Osmers R, Volksen M, Schauer AL. Vaginosonography for early detection of endometrial carcinoma. *Lancet* 1990;335:1569.
- Fleischer AC, Mendelson EB, Bohm-Relez M. Transvaginal and transabdominal sonography of the endometrium. *Semin Ultrasound CT MR* 1988;9:81.
- Sheth S, Hamper UM, Kurman R. Thickened endometrium in post-menopausal women: sonographic-pathologic correlation. *Radiology* 1991;187:1335.
- Granberg S, Wikland M, Karisson B. Endometrial thickness as measured by endovaginal ultrasonography for identifying endometrial abnormality. *Am J Obstet Gynecol* 1991;164:47.
- Hulka CA, Hall DA, McCarthy K. Endometrial polyps, hyperplasia, and carcinoma in post-menopausal women: differentiation with endovaginal sonography. *Radiology* 1994;191:755.
- Coen JR, Luxman D, Sagi J. Sonohysterography for distinguishing endometrial thickening from endometrial polyps in post-menopausal women. *Ultrasound Obstet Gynecol* 1994;4:227.
- Randolf JR, Ying YK, Amier DB. Comparison of real-time ultrasonography, hysterosalpingography, and laparoscopy/hysteroscopy in the evaluation of uterine abnormalities and tubal patency. *Fertil Steril* 1986;49:828.
- Parsons SAK, Lense JJ. Sonohysterography for endometrial abnormalities: preliminary results. *J Clin Ultrasound* 1993;21:87.
- Syrop CG, Sahakian V. Transvaginal sonographic detection of endometrial polyps with fluid contrast augmentation. *Obstet Gynecol* 1992;79:1041.
- Van Rossel J, Wamssteker K, Exalto N. Sonographic investigation of the uterus during artificial uterine cavity distention. *J Clin Ultrasound* 1987;15:439.
- Dubinsky TJ, Parvey HR, Gormaz G, Maklad N. Transvaginal hysterosonography in the evaluation of small endoluminal masses. *J Ultrasound Med* 1995;14:1.
- Bourne TH, Leather A. Use of intracavity saline instillation and transvaginal ultrasonography to detect tamoxifen-associated endometrial polyps. *Ultrasound Obstet Gynecol* 1994;4:73.
- Fleischer AC, Kalemeris GC, Machin JE. Sonographic depiction of normal and abnormal endometrium with histopathologic correlation. *J Ultrasound Med* 1986;5:445.
- Kazadi-Buanga J, Jurado-Chacon M. Etiologic study of 275 cases of endo-uterine hemorrhage by uterine curettage. *Rev Fr Gynecol Obstet* 1994;89:129.
- Shipley CF III, Simmons CL, Nelson GH. Comparison of transvaginal sonography with endometrial biopsy in a symptomatic post-menopausal woman. *J Ultrasound Med* 1994;13:99.
- Dallenback-Hellweg GC. The histopathology of the endometrium. Functional endogenous (hormonal disturbance). Z. Special forms of hyperplasia (focal hyperplasia, polyps, glandular and stromal hyperplasia). In: *Histopathology of Endometrium*. 4th edition. Berlin: Springer-Verlag, 1987.
- Karlsson B, Granber S, Hellberg P. Comparative study of transvaginal sonography and hysteroscopy for the detection of pathologic endometrial lesions in women with post-menopausal bleeding. *J Ultrasound Med* 1994;13:757.
- Feldman S, Shapter A, Welch WR. Two-year follow-up of 263 patients with post-perimenopausal vaginal bleeding and negative initial biopsy. *Gynecol Oncol* 1994;55:56.
- Gaucherand P, Piacenza JM, Salle B. Sonohysterography of the uterine cavity: preliminary investigations. *J Clin Ultrasound* 1995;23:339.