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IN FOCUS

The Role of Ultrasound Imaging in Detecting Endometrial Cancer in Postmenopausal Women with Vaginal Bleeding

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ABSTRACT

Approximately 10% of women with postmenopausal bleeding have endometrial cancer, the most common reproductive organ malignancy among women in the United States. The use of transvaginal ultrasonography allows the clinician to identify women at risk for endometrial cancer and triage them to an appropriate procedure for a histologically confirmed diagnosis.

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Postmenopausal women with unexplained vaginal bleeding present a diagnostic challenge for clinicians. Postmenopausal bleeding (PMB) has been defined as any episode of vaginal bleeding in a woman not using hormone supplementation or unanticipated bleeding in women currently using hormone therapy (Davidson & Dubinsky, 2003). There are a number of benign endometrial disorders such as fibroids, polyps, and hyperplasia that can present with PMB. In the postmenopausal phase of a woman's life when estrogen levels are consistently low, simple atrophy of the endometrium can cause bleeding as the blood vessels of the adjacent myometrium become exposed (Davidson & Dubinsky). For women with PMB, the greatest clinical priority is to evaluate the uterus for an existing malignancy. Among women presenting with PMB, the estimated prevalence of endometrial cancer is generally acknowledged as 10%, although studies report a range up to 60% (Davidson & Dubinsky).

Endometrial cancer is the most common female reproductive system cancer in the United States, and it is estimated that there will be 46,470 new cases and 8, 120 deaths from this condition in 2011 (National Cancer Institute [NCI], 2011). According to the most recent NCI statistics, there has been a steady increase in endometrial cancer incidence and deaths over the last decade (1.1% annual increase from 2004 to 2008 and 0.3% annual increase from 1998 to 2007 respectively) (NCI).

Most cases of endometrial cancer are found in women age 50 and older, with one half of all cases identified in women between ages 50 and 69. The chance of a woman being diagnosed with endometrial cancer during her lifetime is approximately one in 40 (American Cancer Society, 2010). The primary factor associated with an increased risk of endometrial cancer is postmenopausal estrogen use. Other factors that increase a woman's risk of this malignancy, such as obesity, a high-fat diet, tamoxifen use, nulliparity, early menarche, and late menopause, appear to be related to increased estrogen effects on the endometrium (NCI, 2011). It is important to note that most women with endometrial cancer seek care because of abnormal vaginal bleeding (Shipp, 2005).

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Evaluation of Postmenopausal Bleeding

It is essential to examine tissue from the endometrium to obtain (or exclude) a definitive diagnosis of carcinoma. Traditionally, clinicians relied upon endometrial biopsies and curettage to evaluate PMB. Dilatation and curettage (D & C) is no longer considered appropriate for endometrial sampling due to the current availability of alternative methods such as the Pipelle biopsy, which can be performed in the office with considerably less discomfort and cost for the patient (Dubinsky, 2004). However, the majority of women with postmenopausal bleeding are found to have benign causes for these events, which are difficult to identify with Pipelle sampling. Also, more than one half of the postmenopausal women who have endometrial sampling performed are likely to receive insufficient tissue samples due to endometrial atrophy (Shipp, 2005). In some postmenopausal women, atrophic changes in the endocervical canal can lead to stenosis and eliminate the possibility of introducing a Pipelle catheter for tissue collection. In the most recent committee opinion paper from the American College of Obstetricians and Gynecologists (ACOG), endometrial sampling and transvaginal ultrasonography (TVUS) are supported as acceptable tests in the initial evaluation of a PMB. However, TVUS, with its high negative predictive value for endometrial cancer, is identified as a reasonable first diagnostic approach (ACOG, 2009).

Ultrasound imaging of the endometrium is capable of detecting benign conditions that can result in PMB (such as uterine atrophy, fibroids, and polyps) more frequently than biopsy. It is also useful for locating focal areas of endometrial thickening, irregularity, or abnormal vascularity that indicate a likelihood of premalignant or malignant pathology. In one study during which women with a known diagnosis of endometrial cancer underwent blind Pipelle biopsy, 17% of the specimens obtained with this procedure were negative for malignancy (Goldstein, 2010). Another study by Epstein et al. (2001) demonstrated a sensitivity rate of 43% in identifying endometrial cancer through endometrial biopsy. In a meta-analysis of 90 studies, TVUS has been shown to have an accuracy of 98% in reliably excluding carcinoma using an endometrial thickness threshold of 3mm (Timmermans et al., 2010). Prior to this meta-analysis, ACOG established a thickness threshold of 4mm as adequate to exclude a malignancy with approximately 95% accuracy (ACOG, 2009; Goldstein, 2010; Timmermans et al.). Therefore, the use of TVUS in the initial evaluation of a woman with PMB allows the clinician to identify which woman should undergo subsequent endometrial sampling and specific areas of the endometrium to be investigated (Dubinsky, 2004).

Postmenopausal bleeding has benign causes in the majority of cases.

Women using postmenopausal hormone therapy require special consideration when undergoing evaluation of PMB. For those using sequential regimens, alterations of endometrial thickness can exist along with cyclic bleeding. Ultrasound evaluation of the endometrium should be performed 4 to 5 days after scheduled bleeding in these cases. Women on daily continuous regimens can have ultrasound evaluations at any time with the same sensitivity for identifying cancer as found when used for women not on hormone therapy (Davidson & Dubinsky, 2003; Goldstein et al., 2001). In postmenopausal women on hormonal therapy, it is recognized that increased endometrial thickness is more indicative of pathology than irregular bleeding (David & Dubinsky).

In a review of the recent literature, two separate studies explored the cost of evaluating PMB through TVUS versus endometrial biopsy. In the first study (Weber, Belinson, Bradley, & Piedemonte, 1997), the researchers determined that the use of TVUS as an initial diagnostic modality was slightly less expensive than the use of endometrial biopsy but noted that costs might vary by institution. For the second study, the researchers used a cost-minimizing model based on Medicare reimbursement. Findings indicated that the initial use of TVUS in the evaluation of typical women (women with 30% or less prevalence of endometrial cancer or atypical hyperplasia) experiencing PMB predicted a cost savings of up to 16% compared to the initial use of endometrial biopsy for evaluation of this disorder (Medverd & Dubinsky, 2002).

Ultrasound Examinations Performed by Advanced Practice Nurses

A special task force of the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) published guidelines for advanced practice nurses (APNs) and registered nurses (RNs) performing ultrasonography within the

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