A Systematic Review of the Bimanual Examination as a Test for Ovarian Cancer

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Context: An annual bimanual pelvic examination remains widely recommended for healthy women, but its inclusion may discourage attendance. Our goal was to determine the accuracy of the pelvic examination as a screening test for ovarian cancer and to distinguish benign from malignant lesions.

Evidence acquisition: PubMed was searched to identify studies evaluating the accuracy of the bimanual pelvic examination for ovarian cancer diagnosis. Data regarding study design, study quality, and test accuracy were abstracted. Heterogeneity was evaluated and meta-analysis performed where appropriate, including bivariate receiver operating characteristic curves.

Evidence synthesis: Eight studies in screening populations (n=36,599) and seven studies in symptomatic patients (n=782) were identified. Search was completed in November 2013; included studies were published between 1988 and 2009. Screening studies were homogeneous; the summary estimates of sensitivity and specificity of the pelvic examination as a screening test for ovarian cancer were 0.44 and 0.98 (positive likelihood ratio, 24.7; negative likelihood ratio, 0.57). For distinguishing benign versus malignant lesions, there was considerable heterogeneity, with a range of sensitivity from 0.43 to 0.93 and specificity from 0.53 to 0.91.

Conclusions: The bimanual pelvic examination lacks accuracy as a screening test for ovarian cancer and as a way to distinguish benign from malignant lesions. In a typical screening population, the positive predictive value of an abnormal pelvic examination is only 1% (95% CI=0.67%, 3.0%). Its inclusion in a health maintenance examination cannot be justified on the basis of using it to screen for ovarian cancer.

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Introduction

A pelvic examination is routinely performed on women as part of the "annual physical" or "periodic health exam." It typically includes inspection of the external genitalia, a speculum examination of the vagina and cervix (almost always accompanied by a Pap test), and a bimanual examination to palpate the uterus and adnexa. The American College of Obstetrics and Gynecology[1] recently reiterated its support for performing a bimanual examination annually in otherwise healthy women aged ≥21 years, although they note that it may be omitted if desired for otherwise healthy women who have had a total hysterectomy and bilateral salpingo-oophorectomy for benign indications.

Reasons given by physicians for performing the bimanual pelvic examination include that it is a standard part of a well woman examination, to screen for ovarian cancer, to screen for other gynecologic cancers, to screen for sexually transmitted infections (STIs),[2] and as a requirement for hormonal contraception.[3] A study[4] surveyed physicians and found that 47% of obstetrician-gynecologists believed that the pelvic examination is an effective screening test for ovarian cancer. However, the bimanual examination is not needed to screen for STIs[1] and is not recommended as a screening test for gynecologic cancer by the American Cancer Society[5] or the U.S. Preventive Services Task Force.[6,7] It is also no longer recommended as a requirement before receiving oral contraceptives.[1,8,9] Although many women have had an annual pelvic examination in association with screening for cervical cancer, the interval for this screening has increased to 3–5 years for average-

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risk women, calling into question the need to perform an annual bimanual pelvic examination that is not accompanied by a Pap test.[7]

In fact, the knowledge that an annual health maintenance visit is likely to include a bimanual pelvic examination, which many women view as invasive and uncomfortable, can cause anxiety[10] and may actually discourage attendance.[11] As a consequence, some women may not receive other important clinical preventive services. Perhaps even more important is the opportunity cost incurred by performing a pelvic during a periodic health examination, time that might be better spent delivering clinical preventive services that have been proven effective.[12] The objective of the current study is to systematically review the literature regarding the accuracy of the bimanual examination as a screening test for ovarian cancer. A secondary goal is to examine the ability of the pelvic examination to distinguish benign from malignant lesions in women with a known abnormality, the other reason for using the bimanual examination related to ovarian cancer.

Methods

Inclusion Criteria

Two types of studies were identified, screening studies and studies of symptomatic patients. In screening studies, the goal of the bimanual examination was to detect ovarian cancer in an asymptomatic woman. Screening studies that performed a bimanual pelvic examination in asymptomatic women and reported enough information to calculate the sensitivity, specificity, or both for the diagnosis of ovarian malignancy were included. Acceptable reference standards included ultrasound, cancer antigen (CA)-125 testing followed by biopsy if suspicious, or both; laparotomy or laparoscopy; or repeated screening or long-term follow-up in $\leq$12 months.

A second group of studies of symptomatic women was identified, where the intention of the bimanual pelvic examination was to distinguish malignant from benign abnormalities. Prospective cohort studies of women with a known pelvic abnormality who underwent bimanual examination prior to surgery and that reported enough information to calculate the sensitivity and specificity for malignant versus benign lesion were included. Studies where bimanual examinations were performed under anesthesia were excluded, as this is not representative of usual

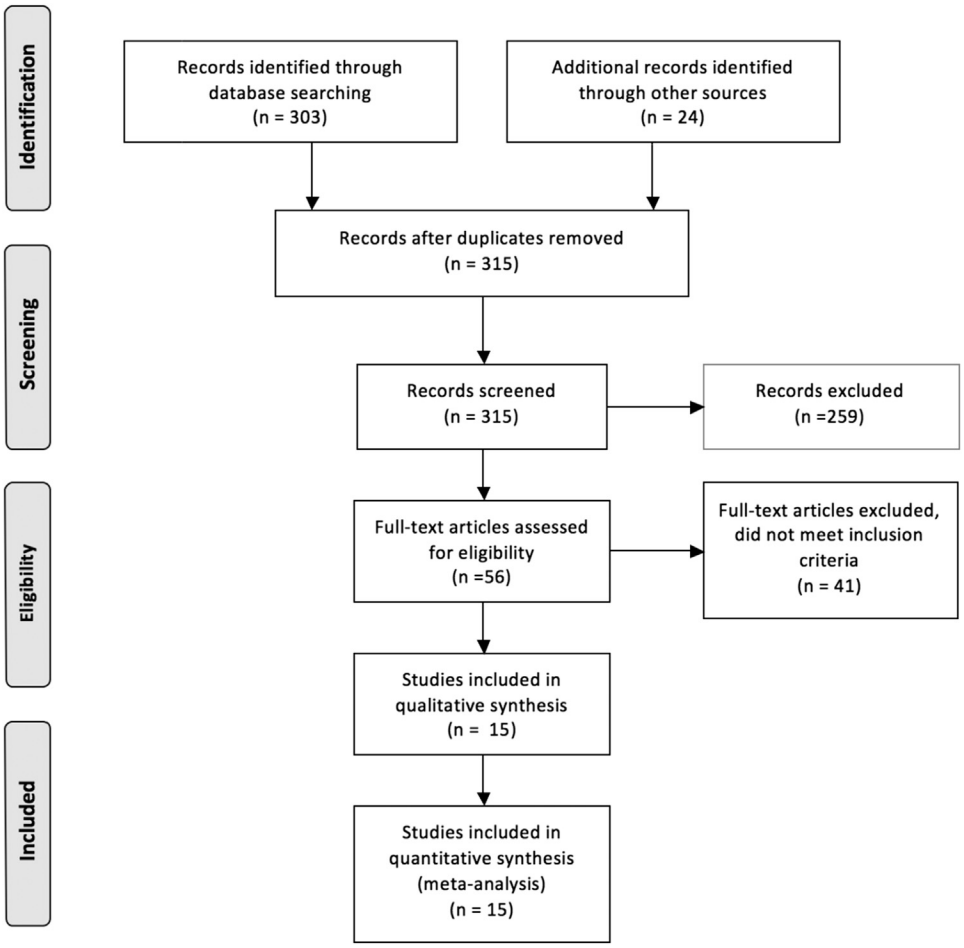

Figure 1. Prisma flow diagram.