

## Medical myth: Bimanual pelvic examination is a reliable decision aid in the investigation of acute abdominal pain or vaginal bleeding

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### ABSTRACT

Reliance on the accuracy of the pelvic examination is upheld in many medical textbooks, but review of the literature does not support the accuracy or reproducibility of this examination. That this "test" is useful for ruling out serious disease will be exposed for the myth that it is.

**Key words:** cervix, examination, interrater reliability, pelvic, uterus

### RÉSUMÉ

La confiance en l'exactitude de l'examen pelvien est soutenue dans de nombreux manuels de médecine, mais une revue de la littérature ne corrobore pas l'exactitude ou la reproductibilité de cet examen. Le présent article dénoncera ce mythe selon lequel le «test» de l'examen pelvien est utile pour écarter les maladies graves.

Bimanual pelvic examination has long been considered essential in the evaluation and management of women with acute abdominal or pelvic symptoms. In the case of pregnant women, the examiner seeks to ascertain the likelihood of abnormal pregnancy, potential abortion, or ovarian torsion. In the case of nonpregnant women, goals include the identification of ovarian torsion, pelvic inflammatory disease (PID) or pelvic abscess. Furthermore, the examiner may wish to elucidate whether a symptom has a pelvic or a nonpelvic source, such as appendicitis or pyelonephritis. There is a growing body of evidence to suggest that many aspects of pelvic examination lack the sensitivity and reliability necessary to confidently rule out or rule in pelvic disease.

Findings on pelvic examination are subjective. Are they reliably reproducible between observers? Close and colleagues showed that bimanual examination performed by

emergency physicians in an urban emergency department (ED) was not reliably reproducible.<sup>1</sup> In that study, all physicians had a minimum of 2 years' postgraduate training. The inter-examiner reliability of a number of variables including cervical motion tenderness (CMT), uterine tenderness, adnexal tenderness, and the presence of an adnexal mass was assessed. Agreement between two examiners performing the examination ranged from 71% to 84%. Worse, the percent positive agreement (defined as the proportion of exams with a positive finding in which both examiners agreed on the finding) was only 17% to 33%.

Although clinicians may agree on the presence of a normal examination approximately three-quarters of the time, there is poor agreement on the presence of abnormal findings. This suggests that decisions based on physical findings can be expected to vary widely from clinician to clinician.

We might expect senior clinicians to have more reliable

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physical examination skills, but this is not always the case. Padilla and coworkers showed that the pelvic examination lacked sensitivity regardless of the examiner's level of experience.<sup>2</sup> This study compared the ability of medical students, gynecologic residents and attending gynecologists to accurately detect adnexal masses under ideal conditions. One hundred and forty patients undergoing laparoscopy or laparotomy had pelvic examinations performed under general anesthesia, eliminating anxiety, guarding and discomfort as confounding factors. Despite these conditions, the sensitivity of the examination for adnexal masses ranged from 15% to 36% regardless of the examiner. Although specificity ranged from 79% to 92%, positive predictive value ranged from 26% to 69%. Up to two-thirds of surgically identified masses were missed by the examination, and up to three-quarters of patients thought to have a mass on exam were misdiagnosed. The examination of the female pelvis is therefore insensitive and unreliable with respect to a number of variables long applied to the clinical decision making process: CMT, adnexal or uterine tenderness and adnexal mass.

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PID has a spectrum of presentation ranging from mild subclinical disease to frank peritonitis.<sup>3</sup> The unreliability of physical examination has been demonstrated, and the overall clinical assessment for PID has been estimated to be accurate only 65% of the time.<sup>4</sup> In addition, for every 100 patients treated for PID based on clinical evaluation alone, it has been estimated that 4 will have ectopic pregnancy and 3 will have acute appendicitis, both associated with significant morbidity when diagnosis is delayed.<sup>5</sup> Furthermore, certain cases of PID may include pelvic abscess requiring invasive management. The studies already discussed suggest that the physical examination is inadequate to identify these cases.

Ovarian torsion is another serious cause of pelvic pain. It may present with subtle findings such as ovarian enlargement or adnexal mass, which are likely to be missed by physical exam. Houry and Abbott reviewed 87 cases of surgically confirmed ovarian torsion.<sup>6</sup> Twenty-nine percent of these patients had no tenderness on pelvic examination,

and no mass was palpable in 53% of patients. Ovarian torsion was included in the admitting differential diagnosis in only 47% of these cases. Although retrospective, this study highlights the limitations of the physical examination.

Early diagnosis is key in ectopic pregnancy. Dart and colleagues showed that no combination of historical or physical findings could reliably rule in or rule out this disease.<sup>7</sup> They evaluated 438 beta-hCG–positive patients who presented with abdominal pain or vaginal bleeding. While many factors on the physical examination were found to be predictive of ectopic pregnancy, including CMT and signs of peritoneal irritation, no constellation of findings had sufficient predictive value to confirm or to exclude the diagnosis. Most cases of ectopic pregnancy in this study had neither CMT nor peritoneal signs. In fact, nearly half of the ectopic pregnancies in the study were low risk by clinical predictors.

An open cervical os has been considered a marker for abnormal intrauterine pregnancy, but the study by Dart and colleagues supports this only in the scenario where a normal intrauterine pregnancy has already been excluded.<sup>7</sup> An open cervical os occurred in 57 patients. Of these, 12 patients were later found to have a normal intrauterine pregnancy, and 4 were found to have an ectopic pregnancy. Once normal intrauterine pregnancy was excluded, 41 of the 45 remaining patients with an open os had an abnormal intrauterine pregnancy. Thus the finding of an open cervical os may be misleading from 10% to 25% of the time.

Given that the physical examination of the pelvis cannot reliably direct patient management, the clinician should consider other methods of evaluation. Andolf and Joergensen compared physical examination of the pelvis with transabdominal ultrasound.<sup>8</sup> They evaluated 194 women admitted to the hospital for laparoscopy or laparotomy and compared the clinical examination and ultrasound with the surgical diagnosis. Ultrasound was more sensitive (83% for ultrasound vs. 67% for examination), although specificity was comparable between the two (96.3% vs. 94%). When divided into correct and incorrect diagnoses, ultrasound again proved the better test (79.4% correct for ultrasound vs. 69.6% correct for examination).

Frederick and colleagues compared clinical examination of the pelvis with transvaginal ultrasound in preoperative patients undergoing laparoscopy or laparotomy for a variety of indications.<sup>9</sup> They found that ultrasound had greater sensitivity (93.8% vs. 65.7%), specificity (98.4% vs. 92.5%), positive predictive value (95.8% vs. 77.5%), negative predictive value (97.7% vs. 87.3%) and test efficiency (97.2% vs. 84.9%) for a wide range of pelvic pathology. In this study, the treating physicians

performed both the examinations and the ultrasounds.

The literature suggests that it is unwise to base decisions on a clinical examination of the female pelvis, regardless of the practitioner's level of experience. In cases where a missed diagnosis is of low consequence, it may be appropriate to pursue more definitive evaluation at some later time. However, in cases where the differential diagnosis in-

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cludes serious pathology of the pelvis, the clinician should not be satisfied with a routine pelvic examination. A positive examination may raise the probability of disease but does not ensure the diagnosis. A negative examination certainly does not rule out disease. More definitive strategies, such as transvaginal ultrasound, should be pursued. The idea that the clinical examination of the female pelvis is an adequate, reliable and reproducible method for evaluating significant pelvic pathology is a dangerous myth.

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