

ACR Appropriateness Criteria[®] on Acute Pelvic Pain in the Reproductive Age Group

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Pre-menopausal women who present with acute pelvic pain frequently pose a diagnostic dilemma, exhibiting nonspecific signs and symptoms, the most common being nausea, vomiting, and leukocytosis. Diagnostic considerations encompass multiple organ systems, including obstetric, gynecologic, urologic, gastrointestinal, and vascular etiologies. The selection of imaging modality is determined by the clinically suspected differential diagnosis. Thus, a careful evaluation of such a patient should be performed and diagnostic considerations narrowed before a modality is chosen. Transvaginal and transabdominal pelvic sonography is the modality of choice when an obstetric or gynecologic abnormality is suspected, and computed tomography is more useful when gastrointestinal or genitourinary pathology is more likely. Magnetic resonance imaging, when available in the acute setting, is favored over computed tomography for assessing pregnant patients for nongynecologic etiologies because of the lack of ionizing radiation.

Key Words: Appropriateness Criteria[®], pelvic pain, acute, imaging, diagnosis

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SUMMARY OF LITERATURE REVIEW

Pre-menopausal women with acute pelvic pain often pose a diagnostic dilemma. They exhibit nonspecific signs and symptoms, the most common being nausea, vomiting, and leukocytosis. The differential considerations encompass gynecologic and obstetric causes

such as hemorrhagic ovarian cysts, pelvic inflammatory disease, ovarian torsion, ectopic pregnancy, impending miscarriage secondary to fetal distress or demise, and placental abruption, as well as nongynecologic etiologies, including appendicitis, inflammatory bowel disease, infectious enteritis, diverticulitis, urethral calculi, pyelonephritis, and pelvic thrombophlebitis. The choice of imaging modality is determined by the clinically suspected differential diagnosis. Thus, a thorough clinical evaluation of such a patient is required to determine the index of suspicion among the various etiologies. Diagnostic considerations should be ordered and narrowed by history, physical examination, and laboratory testing before a radiologic examination is chosen.

Transvaginal and transabdominal pelvic sonography, with its wide availability and ability to narrow the differential diagnosis, is the preferred imaging modality for initial assessment when an obstetric or gynecologic etiology is suspected [1]. Computed tomography (CT) is more useful when gastrointestinal or urinary tract pathology is likely. Magnetic resonance imaging (MRI), with its lack of ionizing radiation, is preferred over CT for

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assessing pregnant patients for these pathologies, but it is hampered by a lack of widespread availability, especially in the acute setting.

Serum β -Human Chorionic Gonadotropin

A serum β -human chorionic gonadotropin (hCG) level is usually obtained when a menstruating woman presents with symptoms of acute pelvic pain. Knowledge of pregnancy is of utmost importance to determine whether ectopic pregnancy should be under consideration, as well as to indicate any added concern for fetal exposure to ionizing radiation. A negative result on β -hCG testing essentially excludes the diagnosis of a live intrauterine pregnancy and acute ectopic pregnancy, because it becomes positive approximately 9 days after conception. Studies published in the late 1980s that correlated the presence of a gestational sac using TVS with β -hCG levels have played a crucial role in our ability to make the diagnosis of ectopic pregnancy. These studies documented the presence of a gestational sac by the time the β -hCG level was 1,000 to 2,000 mIU/mL (international reference preparation) [2-4]. When the β -hCG level is above this discriminatory zone, one should expect to see a gestational sac, and if not, an ectopic pregnancy is likely. The high specificity of adnexal findings, which include the classic "tubal ring," has been widely reported in the literature [5] (see Variant 1).

Ultrasound

The role of pelvic sonography in the evaluation of acute pelvic pain has been well described. Because of higher resolution of anatomic detail, transvaginal sonography (TVS) should be used whenever possible, although transabdominal sonography (TAS) is recommended when uterine and adnexal structures are beyond the field of view of the transvaginal probe. In addition, duplex and color or power Doppler imaging can be used to characterize the vascularity of the ovaries, adnexal structures, and uterus, information helpful in narrowing the field of differential considerations.

In the evaluation of obstetric and gynecologic causes of pain, TVS may be able to differentiate findings of hemorrhagic cyst or pelvic inflammatory disease, more compatible with medical management, from those more suspicious of ovarian torsion, a surgical emergency, and gestational findings of fetal distress or demise or placental abruption requiring urgent obstetrical management (see Variant 2). A hemorrhagic cyst may be hyperechoic acutely, but with hemolysis and retraction of clot, a reticular network of stranding, septations, or fluid-fluid levels between fluid components and congealed red blood cells is demonstrated. A peripheral color Doppler signal with low-impedance flow is characteristic [6]. Usually, only complications of pelvic inflammatory disease can be demonstrated sonographically, although earlier signs, such as thickening of the fallopian tube or

Variant 1. Gynecologic etiology suspected, serum β -hCG positive

Radiologic Procedure	Rating	Comments	RRL
Ultrasound pelvis transvaginal	9	Both transvaginal and transabdominal ultrasound should be performed if possible.	None
Ultrasound pelvis transabdominal	9	Both transvaginal and transabdominal ultrasound should be performed if possible.	None
Ultrasound pelvis with Doppler	9	As an adjunct depending on grayscale findings. Avoid fetal exposure to Doppler.	None
MRI pelvis with or without abdomen with or without contrast	6	If ultrasound is inconclusive or nondiagnostic, add abdominal MRI as indicated. See "Summary of Literature Review" for use of contrast. See comments regarding contrast in text under "Anticipated Exceptions."	None
CT pelvis with or without abdomen with or without contrast	2	Add abdominal CT as indicated. See "Summary of Literature Review" for use of contrast.	High

Note: Rating scale: 1 = least appropriate, 9 = most appropriate. CT = computed tomography; hCG = human chorionic gonadotropin; MRI = magnetic resonance imaging; RRL = relative radiation level.

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