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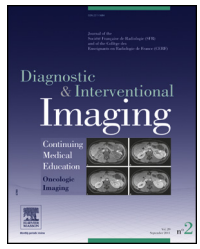

CONTINUING EDUCATION PROGRAM: FOCUS...

Acute pelvic pain in females in septic and aseptic contexts

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Abstract Acute pelvic pain in women is a common reason for emergency department admission. There is a broad range of possible aetiological diagnoses, with gynaecological and gastrointestinal causes being the most frequently encountered. Gynaecological causes include upper genital tract infection and three types of surgical emergency, namely ectopic pregnancy, adnexal torsion, and haemorrhagic ovarian cyst rupture. The main gastrointestinal cause is acute appendicitis, which is the primary differential diagnosis for acute pelvic pain of gynaecological origin. The process of diagnosis will be guided by the clinical examination, laboratory study results, and ultrasonography findings, with suprapubic transvaginal pelvic ultrasonography as the first-line examination in this young population, and potentially cross-sectional imaging findings (computed tomography and MR imaging) if diagnosis remains uncertain.

Acute pelvic pain is a symptom that is far from specific, and when it occurs in non-pregnant women it opens up a wide range of potential diagnoses that are mainly gynaecological and gastrointestinal. In view of this large number of possible aetiologies for acute pelvic pain, we will focus principally on the gynaecological causes.

The medical history, physical examination, and results from laboratory studies will be the initial factors taken into account in putting forward a hypothesis. Whether the patient has sepsis or not will be an important factor in the reasoning process, pointing to different groups of diagnoses, which nonetheless have some subtle features.

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Almost as a matter of course, imaging will take its place in the diagnostic process. Its purpose is above all to exclude a potentially life-threatening (ectopic pregnancy, ruptured haemorrhagic ovarian cyst etc.) or surgical emergency (acute appendicitis, adnexal torsion etc.); as well as, and this is especially crucial in women of childbearing age, excluding medical emergencies that are ''upper genital tract infections'', in which the prognosis for the patient's subsequent fertility may be at stake.

Choice of imaging modalities from clinical findings and laboratory results

In cases of acute pelvic pain, the diagnostic process should be guided firstly by the clinical context:

- age of the patient and hormonal status (Menopause? IUD? Sexually active and potential risk of pregnancy?);
- history of the illness: sudden onset of ''stabbing pain''? Migratory pain? Accompanied by gastrointestinal signs (nausea, vomiting etc.)? Metrorrhagia? Leucorrhoea?;
- findings from the clinical examination: temperature > 38°C? Pulse, blood pressure? Localised guarding? Or generalised? Abnormal vaginal discharge? Pain on uterine motion? Lateral uterine pain?

The results from laboratory tests and a search for any evidence of sepsis will mean that the range of diagnoses for these acute pelvic pains can be narrowed.

Clinical and biological definition of Sepsis

The blood work could include:

- complete blood count (CBC);
- erythrocyte sedimentation rate (ESR), a sensitive but totally non-specific marker that increases in infections, as well as in tumours and autoimmune disease, amongst others;
- C-reactive protein (CRP) is an equally non-specific marker that is raised from as early as the 6th hour, and above the threshold of > 80 mg/L bacterial infection is suspected. However, it is mainly useful in terms of analysis of its kinetics;
- procalcitonin appears even earlier than CRP as it is raised from the 2nd hour, and it is a marker that increases in infections and points towards a bacterial cause if > 2 ng/mL.

Depending on the seriousness of the clinical picture, these tests may be accompanied by blood cultures, lactate testing, or glycemia amongst others. Urinalysis and vaginal swabs may be carried out, depending on the clinical context. In sexually active women a beta-hCG test is also recommended.

Acute inflammatory syndrome or systemic inflammatory response syndrome is defined by the presence of various clinical parameters and laboratory test results (Table 1). Inflammation is a complex response mechanism that aims to circumscribe and repair a tissue lesion whether it is of exogenous (microbial or chemical aggression) or endogenous origin (infarcts, necrosis, tumour, etc.).

Table 1 Definition of sepsis (2003 SFAR consensus conference).

Systemic inflammatory response syndrome	
Temperature	> 38.3°C or < 36°C
Heart rate	> 90 bpm
Respiratory rate	> 20 breaths/min
Glycemia	> 7.7 mmol/L
Leukocytes	> 12,000/mm^3 or < 4000/mm^3
Deterioration of cognitive functions	
Capillary refill time	> 2 s
Lactatemia	> 2 mmol/L
Sepsis	
Systemic inflammatory response syndrome + presumed or identified infection	

Following the October 2003 SFAR (French Intensive Care and Anaesthetics Society) conference, a state of sepsis was defined as the combination of a systemic inflammatory response and a presumed or identified infection. It is therefore a systemic inflammatory reaction of infectious origin, or in other words, an inflammatory reaction that starts at the infected site and spreads to the whole body.

An important point to note, however, is that evidence of inflammation that is not caused by infection can be seen in cases of tissue necrosis. This means that laboratory tests showing elevated inflammatory markers do not equate to the exclusion of some non-infectious causes involving tissue necrosis (necrobiosis of uterine fibroids, adnexal necrosis further to longstanding torsion, etc.).

Which imaging modality best excludes medical, surgical and life-threatening emergencies?

In women ''of childbearing age'' suprapubic ultrasonography should be the initial investigation and this can be supported by a transvaginal ultrasound if necessary. If this investigation is unremarkable or inconclusive, additional cross-sectional imaging (specifically, a CT scan of the abdomen and pelvis) is indicated.

As for haemodynamic findings, these should be sought without waiting for results of the hCG test. Ideally, use of magnetic resonance imaging (MRI) would restrict the radiation dose in young patients while still best exploring pelvic organs. However, access to this form of non-irradiating imaging can be difficult in practice (and even more so in an emergency context) in view of the availability of MRI equipment.

In older women, pelvic ultrasound is still the initial investigation to perform when a gynaecological etiology is suspected; however, to investigate a possible gastrointestinal or genitourinary cause, a CT scan offers superior diagnostic efficacy and should in these cases be carried out in the first instance [1].

According to some authors, [2,3] carrying out a pelvic ultrasound following a CT scan that is considered to be