THEME

Pelvic pain

Ectopic pregnancy

Risk factors and diagnosis

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BACKGROUND

Ectopic pregnancy is still the most common cause of first trimester maternal deaths, accounting for 73% of early pregnancy mortalities.

OBJECTIVE

Detailed management will not be discussed in this review. However, risk factors for tubal ectopic pregnancy, ultrasound diagnosis and the benefits of early pregnancy units will be discussed.

DISCUSSION

All women in the reproductive age group who present to a general practitioner or hospital emergency department with lower abdominal pain, with or without vaginal bleeding, have an ectopic pregnancy until proven otherwise. A urinary pregnancy test is mandatory in this clinical situation and if positive, these women should then have a transvaginal – not transabdominal – ultrasound scan (TVS) performed. The diagnosis of ectopic pregnancy should be based on the positive visualisation of an adnexal mass using TVS rather than on the basis of a scan that fails to demonstrate an intrauterine gestational sac. Diagnosing the condition earlier in its natural history using TVS has changed management options and reduced the associated mortality, with collapse and subsequent emergency laparotomy being the exception rather than the rule in modern practice. Early pregnancy units have been shown to benefit women with early pregnancy complications, reduce unnecessary admissions, reduce costs and are an effective use of resources.

General practitioners or hospital emergency departments (ED) are often the first port of call for women of reproductive age with abdominal pain. All women who present with abdominal pain should be considered to have an ectopic pregnancy until proven otherwise. Ectopic pregnancy was the fourth most common cause of maternal death in the most recent Confidential Enquiry into Maternal Deaths (CEMD) in the United Kingdom 2000–2002; accounting for 11 out of 15 (73%) early pregnancy deaths.[1] In the last triennial report, the mortality rate for deaths from ectopic pregnancies had not declined since the previous triennial report, and was still an increase on the rates described 10 years ago. Two-thirds of women who died from ectopic pregnancy were misdiagnosed in primary care or ED settings.[1] Performing qualitative urine dipstick testing for human chorionic gonadotrophin (hCG) with appropriate use of transvaginal ultrasound scan (TVS) on all women with unexplained abdominal pain certainly has cost implications, however this is one simple way to decrease death rates from ectopic pregnancy. The authors of the CEMD recommended that all clinicians be made aware of atypical clinical presentations of ectopic pregnancy and especially of the way in which it may mimic gastrointestinal disease.[1] In the most recent Australian CEMD, 1997–1999,[2] there was only one direct maternal death attributable to ectopic pregnancy; more recent figures are not yet available.

The incidence of ectopic pregnancy has risen to 2% with the advent of early pregnancy units (EPU) and the use of high resolution transvaginal probes. The number of women with clinically stable ectopic pregnancies diagnosed has significantly increased and consequently treatment modalities have become less radical. The evolution of surgical treatment has progressed from salpingectomy at the time of emergency laparotomy to salpingotomy with conservation of the fallopian tube performed by laparoscopy.[3] More recently, medical management in the

form of systemic methotrexate and even an expectant 'wait and see' approach have been adopted in select cases.[4,5] The management of ectopic pregnancy depends on the woman's clinical state, her level of compliance and wishes, absolute levels of serum hCG, and the experience of the clinician both ultrasonographically and laparoscopically. This will not be discussed in detail in this review.

Qualitative versus quantitative pregnancy test

All GPs and ED staff should be vigilant in any woman of reproductive age with unexplained abdominal pain. Under these circumstances, qualitative urine dipstick testing for hCG, rather than quantitative serum hCG, should be considered mandatory – the test is now quick, easy and sensitive. Women who present with unexplained abdominal pain and their last menstrual period was less than 4 weeks earlier, should still have a urinary pregnancy test. This is far cheaper than maternal serum hCG measurement and a reliable way of excluding pregnancy. If a woman has a negative urinary pregnancy test, this almost invariably means that she does not have an ectopic pregnancy. The test is a monoclonal based antibody test, which, according to the manufacturer's specification, has a sensitivity of 99% at a urine hCG level greater than 25 IU/L. Single or 'one off' quantitative serum hCG measurements are not necessary in the preliminary work up of women with suspected ectopic pregnancy. Such measurements should be used in the EPU setting to evaluate the possibility of nonsurgical management in clinically stable women with ectopic pregnancy or as a means of determining successful resolution in women managed conservatively.[6] Another clinical scenario which would justify the measurement of serum hCG is in women with a pregnancy of unknown location or nondiagnostic early pregnancy scans.[7,8] This is defined as the situation in which a pregnant woman has a first trimester ultrasound scan which demonstrates an empty uterus with no adnexal pathology.

Risk factors for ectopic pregnancy

Greater awareness and understanding of risk factors by GPs is important. According to a meta-analysis, previous ectopic pregnancy, previous tubal surgery, documented tubal pathology, and in utero diethylstilbestrol exposure were found to be associated strongly with the occurrence of ectopic pregnancy. Previous genital infections (pelvic inflammatory disease [PID], chlamydia, gonorrhoea) and infertility were associated with a mildly increased risk.[9] In another meta-analysis evaluating contraception and the risk of ectopic pregnancy, all assessed contraceptives protected against ectopic pregnancy.[10] Women becoming pregnant after sterilisation or while using an intrauterine contraceptive device (IUCD) are at an increased risk. The IUCD is the only contraceptive method associated with increased risk after discontinuation of use.[10] Pregnancy with the levonorgestrel releasing intrauterine system or Mirena IUS in situ is rare, but if it occurs, the likelihood of an ectopic pregnancy is high.[11] Heterotopic pregnancy, defined as concurrent intra- and extra-uterine pregnancies, is rare and seen in 1:10 000 to 1:50 000 spontaneous pregnancies. However, remember that after assisted reproductive techniques such as IVF or GIFT, the incidence is as high as 1%.[12] Women with risk factors for ectopic pregnancy should be advised to attend an EPU for ultrasound assessment as soon as possible in the pregnancy in order to locate the gestation.

Diagnosis of ectopic pregnancy

Rarely do women present with collapse and shock; in fact today, most women present with nonspecific symptoms not too dissimilar to miscarriage. Therefore clinical suspicion is paramount. The early diagnosis of ectopic pregnancy in clinically stable women with TVS is not only potentially life saving, but may decrease the number of operative procedures such as diagnostic laparoscopy and dilatation and curettage.[13] Although laparoscopy is considered the gold standard for the confirmation of ectopic pregnancy,[14] it is no longer the diagnostic tool of choice. In modern practice, the diagnosis of an ectopic pregnancy is ultrasound based and the transvaginal rather than transabdominal approach should always be the primary ultrasound performed in the early pregnancy setting.[15] In a recent study, TVS was found to be acceptable by women and 99% said they would agree to have a similar procedure in the future.[16] Transabdominal ultrasonography is an is outdated modality which is not diagnostic of ectopic pregnancy and should no longer be used. In the presence of an empty uterus, transabdominal ultrasound scan may result in an unacceptably high intervention rate.

The diagnosis of ectopic pregnancy should be based on the positive visualisation of an adnexal mass using TVS rather than on the basis of a scan that fails to demonstrate an intrauterine gestational sac. It is still possible to see ultrasound reports that read 'empty uterus, ectopic pregnancy cannot be excluded'. This is not helpful and may result in unnecessary intervention. If an ectopic pregnancy is present and scanning skills are highly developed, between 87 and 93% should be identified using TVS before surgery.[17–19] Women with clinical signs of a ruptured ectopic pregnancy who are haemodynamically compromised should not have surgery delayed to have an ultrasound examination performed.

Early diagnosis with TVS also allows the clinician to consider conservative management options such as methotrexate[20] or an expectant approach.[21] In carefully selected cases, conservative management of ectopic pregnancy is associated with high rates of resolution.[4] Such management options should be offered and followed up in a specialised EPU. Reproductive outcome after conservative management of ectopic pregnancy has been assessed on the basis of tubal patency rates on hysterosalpingogram and subsequent pregnancy rates. After medical management, ipsilateral tubal patency rates and subsequent intrauterine and ectopic pregnancy rates are 77–82%, 82–87% and 13–18%, respectively.[22–25] After expectant management, these rates are 93%, 63–88% and 4–5%, respectively.[26–28] Should surgery be necessary, a laparoscopic approach should be used in the majority of cases; with advantages in terms of recovery time and bed occupancy well documented.[30–32]

Timing of the scan

Ideally, scanning and diagnosing women with ectopic pregnancies at much earlier gestations would be preferable. It is questionable whether the possible benefits (prevention of complications and reassurance of the woman) outweigh possible detriments (false-positive diagnosis, financial costs, and emotional stress) that could be induced by screening.[33] Screening for ectopic pregnancy with TVS in asymptomatic women at earlier gestations is not advocated. This policy would potentially result in more pregnancies of unknown location, which in turn would result in an increased number of subsequent scans and potential increased maternal anxiety.

Where to perform the scan?

Traditionally in the United Kingdom, women experiencing any abdominal pain or vaginal bleeding in the first trimester would attend their GP or ED. After an initial assessment with or without vaginal examination, referral to the on call gynaecologist would occur. Further assessment and vaginal examination would take place, and depending on experience of the junior doctor, a further senior opinion would often be required before other investigations were arranged. Admission of the woman because of lack of access to outpatient ultrasound facilities would occur. Any serum investigations ordered could potentially take more than 24 hours to get a result. Should surgery be necessary, a further wait on the emergency operating list could be expected resulting in prolonged fasting times until the operation was possible. This was a totally unacceptable experience physically, mentally and financially. Unfortunately this care pathway still exists for most Australian women with early pregnancy complications.

As a consequence, the Royal College of Obstetricians and Gynaecologists introduced a guideline recommending the setting up of a dedicated EPU in all hospitals that was accessible by GPs, women and other hospital departments. This guideline stipulated that the facility should be available on a daily basis or during normal working hours as a minimum.[34] This has resulted in benefits such as rapid diagnosis, creation of a sympathetic environment, prompt gynaecological input, accessible dedicated scanning facilities, reduced unnecessary admissions, reduced costs and preservation of women's dignity.[34–36] It is time Australia followed this model for the diagnosis and management of early pregnancy complications. More recently, acute gynaecology units with ultrasound capabilities have been set up, however there is no data on their direct effect on admission rates and occupied bed stay in the early pregnancy population.[37]

Conclusion

Ectopic pregnancy must be considered by GPs in all women of reproductive age who present with abdominal pain. A greater awareness of risk factors and the use of urinary dipstick testing for hCG enables GPs to arrange prompt ultrasound assessment of women in the first trimester. Improved diagnostic techniques, and in particular high resolution transvaginal probes, now allows ectopic pregnancy to be identified before the development of life threatening events. Transvaginal ultrasound and not laparoscopy is the diagnostic tool of choice in the modern work up of these women. Dedicated EPU, with trained ultrasonographers and gynaecologists experienced in the management of first trimester complications, should become the benchmark standard of care for Australian women in early pregnancy.

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