Ectopic Pregnancy

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Ectopic pregnancy remains a diagnostic and management challenge for nurse practitioners. The incidence and physiology of ectopic pregnancy, the current research on risk factors, detection methods, and management techniques, and counseling strategies are reviewed in this article. In addition, a protocol for nurse practitioners to improve the management and possibly lessen the serious impact of this challenging complication of pregnancy will be discussed.

Ectopic pregnancy has serious consequences for child-bearing women. An oocyte that implants at a site other than the endometrium is strongly associated with infertility and ectopic pregnancy recurrence. It also accounts for 12% of maternal deaths. The perinatal mortality when this occurs is virtually 100% (Kuczynski, 1986).

Ectopic pregnancy remains a diagnostic and management challenge for nurse practitioners (NPs). In this article the incidence and physiology of ectopic pregnancy will be discussed; the current research on risk factors, detection methods, and management techniques will be reviewed; and counseling strategies will be outlined. Finally, development of an NP protocol designed to improve the management and possibly lessen the serious impact of this challenging complication of pregnancy will be discussed.

INCIDENCE

The number of ectopic pregnancies continues to increase in the United States. Approximately 88,000

women in the United States had ectopic pregnancies in 1987 (Nederlof, Lawson, Saftlas, Atrash, & Finch, 1990). Currently, the incidence is approximately 16.8 per 1,000 reported pregnancies (reported live births, spontaneous or legal abortions, and ectopic pregnancies). Ectopic pregnancy surveillance statistics demonstrated a steady increase from 17,800 cases in 1970 to 88,000 cases in 1987 (Nederlof et al., 1990). On a more optimistic note, mortality rates have been decreasing from the 1970s to the 1980s to 0.5 deaths per 1,000 cases. Although fewer women are dying, there is still room for improvement in the identification of ectopic pregnancy in women of childbearing age.

PATHOPHYSIOLOGY

Ninety-six percent of ectopic pregnancies occur in the distal two thirds of the fallopian tube, 2% are interstitial, and 2% are cervical, abdominal, or ovarian.

The fallopian tube has a total length of 10 to 12 cm and is divided into four parts: interstitial, isthmic, ampullary, and fimbrial. It is composed of an outer serosal layer, a muscular layer, and an inner epithelial layer. The tube contains three types of cells (secretory, ciliated, and peg) which are influenced by the fluctuation of estrogen and progesterone levels throughout

TABLE 1.
RESEARCH ON FACTORS ASSOCIATED WITH INCREASED RISK OF ECTOPIC

Factor	% or Rate	Researcher	Sample
Age			
White, age 35-44	3 times more likely than women age 15-24	Nederlof et al., 1990	CDC data
Black and other minorities, age 35-44	4 times more likely than women age 15-24	Nederlof et al., 1990	CDC data
Race			
Black and other minorities	1.4 times that of white women	Nederlof et al., 1990	CDC data
Chlamydia/salpingitis	2.4-7.9 relative risk	Cates & Wasserheit, 1991	Several studies from 1985-1990
Prior ectopic pregnancy	15%-22% recurrence	Joesoef et al., 1991	Historical cohort of 2,501 women
Tubal surgery	2%-7%	Soules et al. as reported in Doyle et al., 1991	Several studies
Ovulation induction agent use	2.7% of all conceptions were ectopic, 3.98 adjusted odds ration	Gemzell et al., 1982 Fernandez et al., 1991	289 anovulatory women Case controlled study with 279 women
Assisted reproduction techniques	5% ectopic occurrence	Data from the 1990 IVF and ET registry	16,405 retrieval cycles
IVF	5.6% (24 of 428 pregnancies)	Dor et al., 1991	2,624 retrieval cycles
ET	8.6% (48 of 556 pregnancies)	Dubuisson et al., 1991	3,103 retrieval cycles
Progesterone-only pill users	Ectopic risk is elevated 2-5 times	Reported in Stabile & Grudzinkas, 1990	
DES exposure	4-5 fold increase in ectopics	Reported in Stabile & Grudzinkas, 1990	
Recurrent spontaneous abortion	4 times more likely to have had an ectopic	Fedele et al. as reported in Doyle et al., 1991	161 women with spontaneous abortions
IUD use	Same rate as nonuser of contraception	Ory as reported in Stabile & Grudzinkas, 1990	Retrospective case controlled study, 615 women with prior ectopic and 3,453 matched controls
Unintended pregnancy in a progestin IUD user	117 ectopics per 1,000 pregnancies	Sivin 1991	
Unintended pregnancy in a copper IUD user	37 ectopics per 1,000 pregnancies	Sivin 1991	
Sterilization failure	7.6% ectopic rate in cases of sterilization failure	Greisman 1991	Review of 290 cases of ectopic pregnancy from 1981-1987

Note. CDC = Centers for Disease Control and Prevention, IVF = in vitro fertilization, ET = embryo transfer, DES = diethylstilbestrol, IUD = intrauterine device.

the menstrual cycle (Russell, 1987). Appropriate secretion of tubal fluid and synchronized cilia movement facilitate the transport of the fertilized egg to the uterus. The fallopian tube, when functioning normally, captures the oocyte and transports it to the uterus. Any number of factors can disrupt this process.

In approximately 40% of cases no underlying pathology is found. Damage to the tubal mucosa from various sources probably accounts for about half of all ectopic pregnancies (Doyle, DeCherney, & Diamond, 1991). Other possible mechanisms include immature or post-mature eggs which implant at an inappropriate time. Additionally, altered estrogen and progesterone levels may cause tubal implantation as a result of immobilized cilia or smooth muscle.

RISK FACTORS

Many risk factors have been associated with the occurrence of ectopic pregnancy. Some of these factors have been well researched and documented; among others, the association is less clear. The research on factors associated with increased risk of ectopic pregnancy is presented in Table 1. However, it should be emphasized again that in 41.9% of patients no risk factors can be identified (Stock, 1988).

The most frequently examined factor is pelvic inflammatory disease (PID) or salpingitis. Salpingitis, a common cause of deciliation, tubal adhesions, and fimbrial destruction is usually a result of a sexually transmitted infection from either gonorrhea, chlamydia, or mixed

aerobe-anaerobe organisms. The tubal damage from salpingitis is irreversible; if it is serious enough to cause an initial ectopic pregnancy the same intraluminal dysfunction remains to cause recurrent ectopic pregnancies. Findings by Cummings, Honore, Scott, and Williams (1988) suggest that microscopic tubal damage may be important in the genesis of ectopic pregnancy even when the tubes have appeared as normal via hysterosalpingogram. Although PID represents the most clear-cut risk factor for ectopic pregnancy little has been done to eliminate it. More aggressive efforts at prevention, diagnosis, and prompt treatment are needed. NPs need to screen for evidence of PID at yearly gynecological examinations because early detection and treatment can prevent extensive tubal damage (Catlin & Wetzel, 1991). Educating patients about prevention of this risk factor and other sexually transmitted diseases by use of condoms should be a routine part of management.

DETECTION METHODS

A high index of suspicion should be maintained when assessing a patient with a possible ectopic pregnancy. While ectopic pregnancy is associated with all of the risk factors listed in Table 1, none of them consistently lead to the diagnosis. A ruptured ectopic pregnancy is a true life-threatening emergency when the patient is unstable, requiring rapid detection and immediate surgical treatment. Stable patients with unruptured ectopic pregnancies can be managed in consultation with a physician. Detection methods, including clinical history and examination, biochemical tests, ultrasound, endometrial curettage, and laparoscopy, are needed to formulate a diagnosis. A review of the current research in this area follows.

CLINICAL HISTORY AND EXAMINATION

The classic clinical picture of ectopic pregnancy is a triad of symptoms: abdominal pain, missed menses, and vaginal bleeding. These symptoms also occur in other conditions, such as PID, ruptured corpus luteum, dysfunctional uterine bleeding, threatened abortion, pelvic mass, appendicitis, ureteral colic, gestational trophoblastic neoplasia, endometriosis, and intrauterine pregnancy with inaccurate dates.

Studies show that abdominal pain occurs in 95% to 100% of patients. The character of the pain has been described as cramping, dull, achy, and sharp. The severity has been rated as mild, moderate, and severe. The pain can be located in any area of the abdomen and may be unilateral or bilateral. Missed menses have been reported in 75% to 95% of patients with most

TABLE 2.
CLINICAL SYMPTOMS

Abdominal pain
Missed menses
Vaginal bleeding
Nausea and vomiting
Dizziness
Faintness and syncope
Breast tenderness
Urinary tract symptoms
Shoulder pain
Diarrhea
Passage of tissue

patients experiencing amenorrhea of 6 to 9 weeks duration. Many patients become symptomatic 5 to 6 weeks into the pregnancy depending on the site of implantation and fallopian tube accommodation. However, these data cannot be relied upon consistently because one third of patients will not know the date of their last menstrual cycle (Stabile & Grudzinkas, 1990). Vaginal bleeding has been reported in 50% to 90% of affected populations with varying degrees of severity. Clinical symptoms are listed in order of frequency of occurrence in Table 2.

Findings of clinical examinations often vary. A common finding is abdominal tenderness; rebound tenderness is less frequent. A palpable mass is present in approximately one half of patients. Adnexal tenderness is present in 98% of patients and pain with manipulation of the cervix in 97% (Alsuleiman & Grimes, 1982). Blood pressure and pulse vary considerably and correlate with amount of blood loss. Most patients are afebrile, thus aiding in the differential diagnosis of PID. Many studies report a normal-sized uterus (Stabile & Grudzinkas, 1990). An enlarged uterus is described in 25% of cases. Because of the extreme variability in the clinical history and examination findings, additional diagnostic techniques must be used to make accurate diagnoses.

BIOCHEMICAL TESTS

The diagnosis of ectopic pregnancy in a clinically unstable patient is not a diagnostic dilemma. The pregnant patient who is experiencing acute abdominal symptoms, vaginal bleeding, and shock is in a life-threatening situation with a mortality rate of 0.5 per 1,000 cases. These patients are immediately sent for laparoscopy or laparotomy where the diagnosis is made accurately and surgical intervention undertaken. The difficult diagnosis of ectopic pregnancy occurs when a stable patient early in pregnancy or not yet known to be pregnant presents with abdominal pain.

A stable patient with a human chorionic gonadotropin

(HCG) level of <2,000 mIU/mL (which is below the level needed to reliably visualize a gestational sac via transvaginal ultrasound) will benefit from serial HCGs performed every 2 days. Approximately 75% of patients with ectopic pregnancy will present with this situation. Serial HCG testing was developed from the work of Kadar, Caldwell, and Romero (1981) who examined HCG doubling times. In a normal early intrauterine pregnancy with an HCG level of <2,000 mIU/mL, the level doubles every 1.98 days. In ectopic pregnancy, there is a <66% increase in the value in 2 days.

If the patient is stable, the level can be followed every 2 days until (a) it is >2,000 mIU/mL where transvaginal ultrasound is reliable for detection of intrauterine pregnancy; (b) the level falls off or fails to rise, indicating probable spontaneous abortion or resolution of the ectopic; or (c) the value is rising, but abnormally, so that the likelihood of ectopic or spontaneous abortion still exists.

In a study conducted by Daus, Mundy, Graves, and Slade (1989) of 357 patients with possible ectopic pregnancy there was a significant difference in the HCG levels between patients with intrauterine pregnancy and those with ectopic and abnormal intrauterine pregnancy. There was no significant difference found in HCG levels between the ectopic group and the abnormal pregnancy group making distinguishing between the two difficult. Kadar and Romero (1988) found in their study of 108 women with possible ectopic pregnancy or spontaneous abortion that the HCG levels fell more slowly in women with ectopic pregnancy than with spontaneous abortion. When the half-life of HCG was <1.4 days, only 7.6% of women had ectopic pregnancy; when the half-life was >7 days, 86% of women had ectopics. Kadar and Romero felt that women with rapidly falling levels could be managed expectantly.

When screening patients with possible ectopic pregnancy in an office setting, a pregnancy test sensitive to 30 mIU/mL will effectively detect 99% of ectopics (Romero et al., 1985). A negative test of this sensitivity will virtually exclude the diagnosis of ectopic pregnancy, although rare cases of ectopic with levels of 10 mIU/mL have been reported. It is important to know which test is being performed and at what sensitivity level to manage patients with possible ectopic pregnancy in the office setting.

Other tests performed in the office setting with stable patients may include complete blood count with differential, blood type and Rh factor, urinalysis for microscopic evaluation and culture, and cervical cultures for gonorrhea and chlamydia.

ULTRASOUND

Transvaginal ultrasound can reveal the presence of an intrauterine pregnancy 7 days earlier than abdominal methods. A gestational sac within the uterus can be visualized consistently at levels of ≥2,000 mIU/mL (Cartwright, 1991), effectively lowering the diagnostic gap. Transvaginal ultrasound is also superior in identifying other signs of ectopic pregnancy such as adnexal mass, extrauterine pregnancy, and free peritoneal fluid. Rarely (1 in 30,000) a combination of intrauterine and ectopic pregnancy occurs. This incidence has been reported as even higher by Stabile and Grudzinkas (1990) when in vitro fertilization and embryo transfer are used (1 in 110). Although this situation remains a difficult diagnosis, the use of transvaginal ultrasound to detect both the intrauterine and ectopic pregnancy is helpful.

In a study by Thorsen et al. (1990), 193 women with suspected ectopic pregnancy were evaluated by transvaginal and abdominal ultrasound and HCG levels. Transvaginal ultrasound detected 38% of the patients with surgically proven ectopic pregnancies; abdominal ultrasound detected 22%. All 83 intrauterine pregnancies were identified with the transvaginal approach, whereas only 34 were identified with abdominal ultrasound. The authors concluded that transvaginal ultrasound was superior to abdominal ultrasound in evaluating suspected ectopic pregnancy. Bocciolone, Vercellini, Rognoni, Dorta, and Fedele (1991) evaluated 116 stable women admitted for possible ectopic pregnancies with subacute pelvic pain via urine pregnancy test (sensitive to 20 mIU/mL) and transvaginal ultrasound. They found the combination of urine testing and transvaginal ultrasound to have a 99% sensitivity and 80% specificity, with positive and negative predictive values at 97% and 92%, respectively. They concluded that this was a simple, rapid, easily available, and accurate method of diagnosing ectopic pregnancy in patients with subacute pelvic pain. From this information it can be concluded that if available, transvaginal ultrasound should be performed in all patients suspected of having ectopic pregnancy.

While transvaginal ultrasound is preferred, there may be rural settings where it is not available and abdominal ultrasound must be used. The role of abdominal ultrasound is to exclude the diagnosis of ectopic pregnancy by demonstration of an intrauterine sac, assuming ectopic and intrauterine pregnancies rarely occur together. Because the ectopic pregnancy and other signs of ectopic pregnancy are usually not visible with abdominal ultrasound, a pregnancy of 4 weeks gestation or 6 weeks from last menstrual period with HCG levels of >6,000 mIU/mL is usually visible via this approach. Absence of a gestational sac raises the suspicion of ectopic pregnancy.

The date of last menses is unknown in one third of

patients (Stabile & Grudzinkas, 1990), and irregular bleeding may confuse the date of last menses as well, requiring correlation of the presence of a gestational sac with HCG levels. Patients with an HCG level of ≥6,000 mIU/mL with an empty uterus on abdominal ultrasound should be considered ectopic until proven otherwise.

CULDOCENTESIS

In culdocentesis the fluid from the transvaginal aspiration of the posterior cul-de-sac of Douglas is examined. A positive tap is 0.5 cc of nonclotted blood, a negative tap is 0.5 cc of serosanguinous fluid, and no fluid is considered nondiagnostic. A positive test is present in 70% to 90% of patients with ectopic pregnancy, but many other conditions where blood may pool in the cul-de-sac can cause a false positive such as a hemorrhagic corpus luteum cyst, incomplete abortion, retrograde menstruation, or endometriosis (Cartwright, 1991). Negative taps are obtained from 10% to 14% of patients with ectopics when there is an intact unruptured ectopic or when blood loss is slight (Cartwright, 1991; Stabile & Grudzinkas, 1990). Culdocentesis cannot be performed in patients with a retroverted uterus or mass in the cul-de-sac. The procedure is painful and some prefer not to perform it in stable patients. In an unstable patient it can provide decisive information and often is performed prior to surgical intervention. Controversy over the value of culdocentesis exists now that transvaginal ultrasound has been proven to be an adequate diagnostic procedure.

ENDOMETRIAL CURETTAGE

Endometrial curettage frequently is performed in cases of possible ectopic pregnancy where the HCG is falling, but the location of the pregnancy is still uncertain. Ectopic pregnancy usually is ruled out if products of conception are found, except in rare cases of concomitant ectopic and intrauterine pregnancy. If no villi are found, laparoscopy is usually indicated to rule out ectopic pregnancy, unless the clinical picture strongly suggests a completed abortion.

LAPAROSCOPY

Laparoscopy is considered the optimal invasive diagnostic technique for identifying ectopic pregnancy. It is indicated in the patients with the following situations:
● a positive culdocentesis;
● transvaginal ultrasound showing no intrauterine sac with a complex adnexal mass and cul-de-sac fluid;
● transvaginal ultrasound showing no sac and HCG level is >2,000 mIU/mL; and

● falling HCG levels and endometrial curettage demonstrating no villi (Nager & Murphy, 1991).

Laparoscopy provides a positive diagnosis in >90% of cases of ectopic pregnancy. Missed diagnosis is usually limited to very early ectopic pregnancy (Stabile & Grudzinkas, 1990). Very unstable patients usually will need a laparotomy.

DETECTION OF ECTOPIC PREGNANCY BY ALGORITHM

Research shows that the clinical presentations and examination findings in patients with suspected ectopic pregnancy are extremely variable. From a review of the literature the diagnostic tests most helpful in identifying these patients are serial HCG levels, transvaginal ultrasound, and, if needed, endometrial curettage and laparoscopy. Nager and Murphy (1991) and Stovall and Ling (1991) have developed algorithms for the detection and management of ectopic pregnancy that are very useful in identifying when to perform these tests. Presented in Figure 1 is an algorithm for the detection and treatment of ectopic pregnancy adapted from these authors. The algorithm minimizes diagnostic errors and facilitates the initiation of appropriate treatment.

TREATMENT STRATEGIES

The management of ectopic pregnancy can be divided into two categories: surgical treatment and medical management. Surgical treatment is further divided into conservative laparoscopic salpingostomy or salpingectomy and the more invasive laparotomy. Medical management includes chemotherapy with methotrexate or expectant management until spontaneous resolution occurs. These methods and the follow-up care for patients with ectopic pregnancy are reviewed in the following paragraphs.

SURGICAL TREATMENT

Few patients who are hemodynamically stable will require the increased cost and higher morbidity of laparotomy. In a study by Silva (1988) all 22 patients who presented with a hemodynamically stable ectopic pregnancy were treated by laparoscope. Stabile and Grudzinkas (1990) reviewed a study of 79 patients with ectopic pregnancy in which all were treated with laparoscopy and only 2 required further laparotomy to control for continued bleeding. Laparoscopy was associated with shorter hospital stay, less postoperation discomfort, and earlier return to normal activities. Currently, laparotomy is reserved for hemodynamically unstable patients only.

Suspected Ectopic Pregnancy
|
Urine HCG (sensitive to 20 mIU/mL)
|
Negative diagnosis virtually excluded
|
Positive

Asymptomatic/ at risk   Symptomatic/ stable   Symptomatic/ unstable
|
Possible transvaginal ultrasound or culdocentesis with surgical consult/ management
|
Laparotomy or laparoscopy

HCG > 2,000 or Serial HCG increasing
|
Transvaginal ultrasound
Negative   Positive
| |
IUP confirmed   No sac, adnexal mass
| |
(Note: heterotopic pregnancy occurs at a rate of 1/30,000 possibly higher in IVF and ET)   Surgical consult/ management

Asymptomatic   Symptomatic
                        |
                        Surgical management with laparoscopy

HCG decreasing   HCG increasing or increasing subnormally   Tubal damage   No tubal damage
| | |
Expectant management: observe until HCG normal, D & C, or methotrexate   Laparoscopic diagnosis   Non-laparoscopic diagnosis   Salpingectomy   Salpingostomy

Mass > 3.5 cm   Mass < 3.5 cm   Mass < 3.5 cm, no cardiac activity
| | |
Salpingectomy   Salpingectomy   Possible candidate for methotrexate
| |
Salpingostomy   Salpingostomy
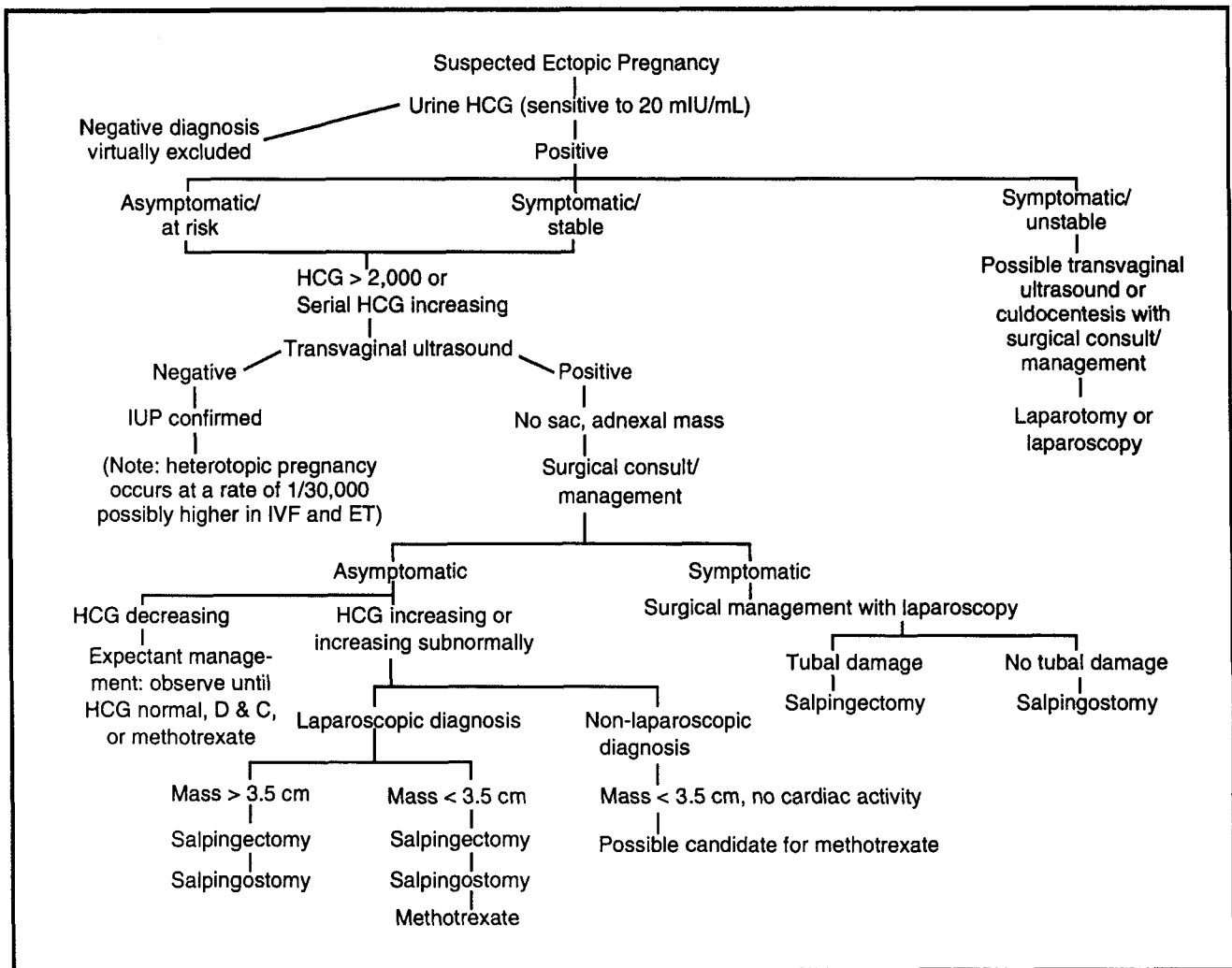 |
                    Methotrexate

FIGURE 1. Algorithm for the detection and treatment of ectopic pregnancy. Adapted from Stovall and Ling (1991) and Nager and Murphy (1991).

Intrauterine pregnancy rates and ectopic pregnancy recurrence rates were reviewed by Bateman and Taylor (1991). After conservative laparoscopic surgery for ectopic pregnancy 49% to 64% of women were found to have subsequent intrauterine pregnancies and 12% to 22% had recurrent ectopics. This study indicates that surgical treatment is effective in resolving ectopic pregnancy but is associated with compromised future fertility. New treatment options for ectopic pregnancy have been investigated in hopes of improving fertility outcomes.

MEDICAL MANAGEMENT WITH OR WITHOUT METHOTREXATE

Improved diagnostic techniques with earlier identification of ectopic pregnancy have made medical management of ectopic pregnancy a possibility. Methotrexate, a folic acid antagonist ideally suited for inhibition of rapidly growing cells such as trophoblasts,

is the agent most extensively used in medical treatment. Kooi & Kock (1988) successfully treated 24 of 25 patients with methotrexate injection into the area of tubal swelling. Several studies of methotrexate treatment were reviewed by Ory (1991). In one study, 25 of 26 patients with ectopic pregnancy experienced resolution of the ectopic with methotrexate. Only one patient required a laparotomy for bleeding. Hysterosalpingograms were performed on 20 patients after 3 months and 15 had patent fallopian tubes. In another study, 34 of 36 women treated with methotrexate experienced successful resolution. It was suggested by Ory that methotrexate can be used in patients with ectopic pregnancy if the following exist:
● the patient is hemodynamically stable;
● no evidence of tubal rupture or hemorrhage is present;
● the tubal distention is <3 to 4 cm;
● no cardiac activity is seen in the ectopic gestation;

and
- the HCG level is <15,000 mIU/mL.

A variety of regimens have been used with mild and transient side effects when low doses are used. Preliminary studies suggest a slightly better fertility potential in patients treated with methotrexate than with laparoscopic salpingectomy or salpingostomy, but more research is needed.

It remains unclear why some ectopic pregnancies continue to proliferate, invade tubal epithelium, and progress to rupture whereas others remain confined to the tube and are spontaneously reabsorbed. Stovall and Ling (1991) reviewed the research and documented cases of spontaneous resolution and found that a downward trend in HCG levels is characteristic of small unruptured ectopics destined to resolve. A rise in HCG levels indicates that surgical therapy or methotrexate should be instituted.

In patients who require laparoscopy for confirmation of diagnosis there is no advantage to waiting for resolution. Because the patient already has experienced a surgical procedure, methotrexate or salpingectomy should be used to resolve the ectopic. Stable patients who have a confirmed nonlaparoscopic diagnosis of ectopic pregnancy, with falling HCG levels and a gestation of <3.5 cm, and who do not wish surgery, can be observed for spontaneous resolution. Although the numbers are small and procedures still experimental, expectant management with or without methotrexate may prevent the tubal damage caused by surgical treatment that results in compromised fertility.

FOLLOW-UP CARE

Ectopic pregnancy is often a rapidly unfolding condition in which there is insufficient time for the patient and family to begin adjustment to the loss until after the treatment has taken place. Many patients are unfamiliar with the term ectopic or tubal pregnancy and are unaware that it carries with it a 100% incidence of perinatal loss. The psychological needs of the woman and her family are the same as those of any person experiencing a pregnancy loss (Osguthorpe, 1987).

Explanation of the grieving process can help the patient and family understand some of the reactions they are experiencing. Somatic responses such as loss of appetite, malaise, and sleeplessness are normal. Feelings of guilt and blame are often present. The patient and her family need factual information on causes of ectopic pregnancy and help to work through the guilt feelings. It is helpful to explain that each person reacts to and expresses loss differently. Open-ended questions may prompt the patient and family to share feelings and discuss concerns (Bowers, 1985). Assessment of when professional help is needed in grief work is part of the

NP's role. The patient and family should be encouraged to participate in support groups for persons experiencing a pregnancy loss. Factual information on recurrence rates and the implications for future fertility should be given. Assisted reproductive techniques are options for patients with blocked or damaged tubes; however, these choices may have serious emotional, physical, and economic implications (Catlin & Wetzel, 1991). Patients who have experienced one ectopic pregnancy are at significant risk for recurrence and should be instructed to obtain evaluation with HCG levels and ultrasound with subsequent pregnancies.

Rh factor should be checked and Rho (D) immune globulin (RhoGAM) given to Rh negative women. Finally, patients who have been treated with methotrexate should use contraception for 3 months after treatment. Depending on the health of the patient, amount of blood loss, and type of treatment, contraception may be advised for one to three cycles after ectopic pregnancy. A serum HCG level should be drawn to evaluate the patient for complete resolution of the ectopic.

PROTOCOL DEVELOPMENT

Review of the current literature on risk factors, diagnostic techniques, and treatment strategies has been incorporated into a protocol for use by NPs. A subjective data, objective data, assessment, and plan format (SOAP) similar to that used by Star, Shannon, Sammons, Lommel, and Gutierrez (1990) has been used to facilitate prompt diagnosis, expedite treatment strategies, and improve follow-up care of the patient with ectopic pregnancy (Table 3).

SUMMARY

The number of ectopic pregnancies continues to increase in the United States. Recurrence rates after ectopic pregnancy are between 12% and 22% and subsequent infertility has been estimated at 36% to 51%. There is a need to identify women at risk for ectopic pregnancy so that early detection can prevent tubal damage, life-threatening rupture, and the serious consequences of repeat ectopic pregnancy and infertility. Risk factors identified in this article associated with ectopic pregnancy are:
- patient with a history of prior PID, prior ectopic pregnancy, tubal surgery, ovulation induction, assisted reproduction, using progesterone-only contraception, diethylstilbestrol exposure in utero, and recurrent spontaneous abortion;
- patient with an unintended pregnancy while using an intrauterine device or following tubal ligation;
- older patient; and

TABLE 3.
A PROTOCOL FOR ECTOPIC PREGNANCY

I. Subjective Findings
  A. Risk factors
     1. History of:
        a. PID
        b. Prior ectopic pregnancy
        c. Tubal surgery
        d. Ovulation induction
        e. Assisted reproduction
        f. Use of progesterone-only pills
        g. DES exposure in utero
        h. Recurrent spontaneous abortions
     2. Pregnant with an IUD
     3. Pregnant with a tubal ligation
     4. Women of older age
     5. Women of black or other minority race
  (Although many risk factors are associated with ectopic pregnancy, none make the diagnosis. Forty-two percent of patients have no risk factors present. A high index of suspicion should be maintained with these patients.)
  B. Clinical history
    The classic triad of symptoms is abdominal pain, missed menses, and vaginal bleeding; however, the symptoms can be extremely variable from a shocky unstable patient to an asymptomatic one. A ruptured ectopic pregnancy is a life-threatening emergency requiring immediate detection and surgical treatment. Stable patients with unruptured ectopic pregnancies can be managed in consultation with a physician. Any of the following symptoms are possible and are presented in order of frequency of occurrence.
     1. Abdominal pain
     2. Missed menses
     3. Vaginal bleeding
     4. Nausea and vomiting
     5. Dizziness
     6. Faintness and syncope
     7. Breast tenderness
     8. Urinary tract symptoms
     9. Shoulder pain
    10. Diarrhea
    11. Passage of tissue
  (The abdominal pain has been described as cramping, dull, achy, or sharp; mild, moderate, or severe; unilateral or bilateral; and located in any area of the abdomen.)

II. Objective Findings
  A. Blood pressure is variable and correlates with blood loss
  B. Pulse is variable and often correlates with blood loss
  C. Temperature is usually normal, aiding in the differential diagnosis of PID
  D. Abdominal tenderness to palpation is common
  E. Rebound tenderness is less common
  F. Adnexal tenderness may be present
  G. Pain with movement of the cervix may be present
  H. Uterus may be normal or enlarged
  I. Blood may be present in vagina
  (Because of the extreme variability in subjective and objective findings, in stable patients where time permits, additional diagnostic tests will be required to make the diagnosis of ectopic pregnancy.)

III. Assessment/Differential Diagnosis
  A. Ectopic pregnancy
  B. R/O PID
  C. R/O Spontaneous abortion
  D. R/O Ruptured corpus luteum cyst
  E. R/O Pelvic mass
  F. R/O Appendicitis
  G. R/O Ureteral calculi or colic
  H. R/O Endometriosis
  I. R/O Gestational trophoblastic neoplasia
  J. R/O Intrauterine pregnancy with inaccurate dates

TABLE 3 (continued).
A PROTOCOL FOR ECTOPIC PREGNANCY

IV. Plan (Consultation with or referral to gynecologist)
Utilize the algorithm for detection and treatment in Figure 1.
  A. Detection methods
    1. Biochemical tests
    2. When screening patients in the office setting, a urine HCG test sensitive to 30 mIU/mL will detect 99% of ectopic pregnancies. A negative test virtually excludes the diagnosis of ectopic pregnancy.
  B. Other tests done in the office setting in stable patients are:
    1. Quantitative serial (every 2 days) HCG levels. Levels will double every 1.98 days in normal intrauterine pregnancies. Ectopic pregnancies demonstrate an increase of <66% in 2 days.
    2. Blood type and Rh factor
    3. Complete blood count with differential
    4. Urinalysis for microscopic evaluation and culture
    5. Cervical cultures for gonorrhea and chlamydia
  C. Other tests
    1. Ultrasound
    Transvaginal ultrasound should be performed in all patients with suspected ectopic pregnancy. A gestational sac can be visualized 1 week earlier than with abdominal ultrasound at HCG levels of >2,000 mIU/mL. It is also superior in identifying other signs of ectopic pregnancy such as: identification and size of adnexal mass, extrauterine gestations, and free fluid in the cul-de-sac.
    2. Culdocentesis
    May be performed in cases where ultrasound is not readily available and in unstable patients. A positive tap is 0.5 cc of nonclotted blood, a negative tap is 0.5 cc of serosanguinous fluid, and no fluid is nondiagnostic. False positive results are possible. A negative tap can also occur when an ectopic is actually present (10%-14%).
    3. Endometrial curettage
    Performed in cases where the HCG level is falling but location of pregnancy is still uncertain. If products of conception are found, ectopic is usually excluded except in rare cases of heterotopic pregnancy.
    4. Laparoscopy
    The optimal invasive detection method, it is indicated in the following situations:
      a. Unstable patients
      b. Patients with a positive culdocentesis
      c. Patients with no sac, a complex adnexal mass, or fluid in the cul-de-sac on ultrasound
      d. Patients with no sac, an initial HCG level of 2,000, now subnormally increasing
      e. Patients with no sac, an initial HCG level of 2,000 now decreasing but no villi on D & C
  D. Treatment strategies (Surgical and expectant medical management is provided by obstetrician/gynecologist)
    1. Surgical management consists of laparoscopic salpingectomy or salpingostomy or laparotomy depending on the condition of the patient
    2. Expectant medical management with or without methotrexate may be possible in hemodynamically stable patients, with no evidence of tubal rupture or hemorrhage, a tubal distention of <3 to 4 cm with no cardiac activity, and an HCG level of <15,000 mIU/mL.
  E. Follow-up care
    1. Grief and loss counseling and assessment if professional help is needed
    2. Facilitation of patient and family participation in support groups for persons experiencing a pregnancy loss
    3. Provide information on recurrence and fertility rates after ectopic pregnancy
    4. Educate the patient that at any time she suspects she is pregnant in the future she should obtain evaluation with HCG levels and transvaginal ultrasound to confirm the location of the pregnancy
    5. Rh negative women should receive RhoGAM
    6. Contraception may be advised for 1-3 cycles
    7. Obtain serum HCG to evaluate for complete resolution of the ectopic pregnancy

Note. PID = pelvic inflammatory disease, DES = diethylstilbestrol, IUD = intrauterine device, HCG = human chorionic gonadotropin, D & C = dilation and curettage.

● black or other minority women.

The majority of the risk factors except for PID are not preventable. NPs need to screen for causes of PID and educate patients on prevention via the use of condoms. Clinicians should be cognizant of the current risk factors and have an increased index of suspicion for ectopic pregnancy in patients with these risk factors. Further research on risk factors is needed.

Improvement has been made in detection of ectopic pregnancy in recent years, probably contributing to the decrease in mortality. The clinical history and examination remain variable; the most common symptoms are abdominal pain, amenorrhea, and bleeding. Diagnostic tests are more helpful than clinical findings. Serial HCG levels, transvaginal ultrasound, and, if needed, laparoscopy and endometrial curettage are the most useful diagnostic tests and appropriate if used according to the algorithm in Figure 1.

Early detection of ectopic pregnancy has changed the treatment in the last decade to include, in stable patients, conservative laparoscopic surgery or expectant medical management with or without methotrexate. With these newer methods, improved rates of fertility and fewer recurrent ectopic pregnancies should occur. Follow-up care includes directing the patient and family to expert counseling and providing information on recurrence and fertility issues.

Increased knowledge of risk factors, early diagnosis, appropriate management, and comprehensive follow-up care of patients with ectopic pregnancy is needed to lessen the serious impact of this complication of pregnancy.

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