Ectopic Pregnancy: Is It Really an Enormous Phobia for Emergency Physicians?

Ektopik gebelik: Acil hekimi için gerçekten büyük bir fobi mi?

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SUMMARY

Objectives: Any pregnancy in which the implantation occurs outside the uterine cavity is defined as ectopic pregnancy (EP). Approximately 2% of all pregnancies are diagnosed as ectopic pregnancy. Ruptured EP is the most life-threatening emergency in the first trimester of pregnancy. The objective of this study is to determine the incidence of unstable ectopic pregnancy with abnormal vital signs and to find out the risk factors.

Materials and Methods: This retrospective study was conducted in a university emergency department with 50.000 annual visits per year. Patients diagnosed as ectopic pregnancy between 2002 and 2007 were determined from the computerized database (Mediacil® software) of the hospital and enrolled to the study. The age of the patient, symptoms and vital signs at the presentation, ectopic pregnancy risk factors, the human chorionic gonadotrophin (hCG) levels and the treatment choice were recorded.

Results: Sixty-three patients diagnosed as ectopic pregnancy during the study period. The mean age of patients was 29.9±5.3 (min 21- max 44). The prevalence of ectopic pregnancy in our patient population was 3.4%. Six (9.5%) of all the ectopic pregnancy patients, evaluated in the emergency department had unstable vital signs and 4 patients (6.3%) presented with syncope. 20.6% of all the patients in the study had high risk, 27% of them had moderate risk and 52.4% had low risk. History of previous ectopic pregnancy were the most seen risk factor among the high risk factors (n=12, 19%).

Conclusion: The most common emergency department symptoms of ectopic pregnancy are abdominal pain and vaginal bleeding. Especially the patients with previous ectopic pregnancy are risky for a recurrent ectopic pregnancy. All female patients in childbearing age disregarding the vital signs should be evaluated for an ectopic pregnancy.

Key words: Ectopic pregnancy; emergency department; risk factors.

ÖZET

Giriş: *Gebelik materyalinin uterus dışına yerleşmesi ektopik gebelik (EG) olarak tanımlanmaktadır. Tüm gebeliklerin yaklaşık %2'si ektopik gebeliktir. Ektopik gebelik rüptürü birinci trimesterde yaşamı en fazla tehdit eden acil durumdur. Bu çalışmanın amacı ektopik gebelik ile acil serviste değerlendirilen hastalardan stabil olmayanların prevalansını saptamak ve risk faktörlerini araştırmaktır.*

Gereç ve Yöntem: *Bu çalışma geriye dönük olarak 2002-2007 yılları arasında, yıllık hasta sayısı 50.000 olan üniversite hastanesi acil servisinde gerçekleştirildi. Ektopik gebelik tanısı alan hastalar hastanemizin bilgisayar tabanlı veri tabanı (Mediacil®) taranarak saptandı. Hastaların demografik verileri, acil servise başvuru şikâyetleri, başvuru vital bulguları ve ektopik gebelik risk faktörleri kayıt edildi.*

Bulgular: *Çalışma süresince boyunca ektopik gebelik tanısı alan 63 hasta çalışmaya alındı. Hastaların yaş ortalaması 29,9±5,3 (minimum 21 - maksimum 44) idi. Çalışma periyodu süresince acil servisteki ektopik gebelik prevalansı %3,4 olarak bulundu. Ektopik gebelik tanısı ile acil serviste değerlendirilen hastaların %9,5'inde (n=6) stabil olmayan vital bulgular mevcut iken hastalardan, %6,4'ü (n=4) senkop nedeniyle acil servise başvurdu. Ektopik gebelik saptanan 63 hastanın risk faktörleri geriye dönük olarak incelendiğinde; yüksek riskli %20,6, orta riskli %27 ve düşük riskli ile risk olmayan grup %52,4 olarak saptandı.*

Sonuç: *Ektopik gebelik nedeniyle acil servise başvuran hastalarda en sık görülen şikâyet karın ağrısı ve vajinal kanamadır. Daha önceden ektopik gebelik öyküsü olan hastalar yeniden ektopik gebelik gelişimi açısından risk altındadırlar. Doğurganlık çağındaki tüm bayan hastalarda vital bulgularına bakılmaksızın ektopik gebelik göz önünde bulundurulmalıdır.*

Anahtar sözcükler: *Ektopik gebelik; acil servis; risk faktörleri.*

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Introduction

Any pregnancy in which the implantation occurs outside the uterine cavity is defined as ectopic pregnancy (EP). Ruptured EP is the most life-threatening emergency in the first trimester of pregnancy. Approximately 2% of all pregnancies are diagnosed as ectopic pregnancy.[1] Fertilization of the ovum occurs in fallopian tube. In normal pregnancy, cell division of the zygote formation produces blastocyst and after 7 days vacation the implantation occurs into the uterine cavity. If any cause impedes this transport, implantation of the blastocyst occurs anywhere except uterine cavity and produces ectopic pregnancy. Although abdominal, ovarian or cervical implantations can be seen; the most common location for an ectopic pregnancy is in the fallopian tubes. Pregnancies in the fallopian tube account for 97% of all ectopic pregnancies: 55% is in the ampulla; 25% in the isthmus; 17% in the fimbria and 3% in the abdominal cavity, ovary, and cervix.[2]

In the emergency department, female patients with the classic triad of abdominal pain, amenorrhea and vaginal bleeding should always alert the clinician to consider for an ectopic pregnancy. Most common physical findings were abdominal tenderness and adnexial tenderness.[1-3] Although these classic symptoms and physical findings are common, ectopic pregnancy may be subtle or the clinical signs may reveal tachycardia, orthostatic changes and syncope in contrast to unremarkable presentation. In the early period of ectopic pregnancy the diagnosis of ectopic pregnancy can be missed and ectopic pregnancies may be diagnosed after tubal rupture. If blood loss from the rupture to abdominal cavity is too much, the patient may be presented with symptoms of shock.

The objective of this study was to determine the incidence of unstable ectopic pregnancy cases which is a great phobia for emergency physicians in the differential diagnosis of acute abdominal emergencies and the possible risk factors.

Materials and Methods

Study design

This was a retrospective study on patients with a final diagnosis of ectopic pregnancy.

Study Setting

The study took place in a university emergency department with 50.000 annual visits per year. The patients diagnosed as ectopic pregnancy between 2002 and 2007 were enrolled to the study.

Data collection

The patients' data were recorded from computer based patient database program (MediAcil®) used in the emergency department. The age of the patient, symptoms and vital signs at the presentation, ectopic pregnancy risk factors, the human chorionic gonodatrophin (hCG) levels and the treatment choices were recorded.

Patient Selection

All female patients in childbearing age, diagnosed as ectopic pregnancy according to ICD-10 codes (International Code of Disease, code O.00) were enrolled to the study.

Definitions

The diagnosis of ectopic pregnancy

The diagnosis of ectopic pregnancy was approved with high hCG measurements and sonography (transabdominal-transvaginal).

Ectopic pregnancy risk factors

The risk factors were classified as high, moderate and weak or no associated risk factors. High risk factors were previous ectopic pregnancy, previous tubal surgery, history of tubal ligation, in utero diethylstilbestrol (DES) exposure and current use of intrauterine device (IUD). Moderate risk factors were history of pelvic inflammatory disease (PID), history of infertility, smoking, history of gonorrhea and history of Chlamydia. Weak or no associated factors were outpatient treatment of chlamydia/gonorrhea, sexual partners >1, coitarche <18 age, past use of IUD, history of threatened abortion, nontubal surgery and prior cesarean section (Table 1).[4]

Definitions of unstable vital signs

The parameters determined in Rapid Emergency Medicine Score System (REMS) were accepted as normal vital signs.[5] According to these parameters;

Mean arterial pressure (mmHg) : 70-109

Pulse rate (beats/min) : 70-109

Respiratory rate (breaths/min) : 12-24

Peripheral oxygen saturation (%) : >89

Statistical Analysis

Data from completed forms were entered and analyzed by using a computer-based database (SPSS 16.0, Statistical Package for the Social Sciences, Chiago, III, USA).

Table 1. *Risk factors for ectopic pregnancy.*[4]

High	Moderate	None-Weak
Previous ectopic pregnancy	History of PID	Outpatient treatment
Previous tubal operation	History of infertility	Sexual partners >1
History of tubal ligation	Smoking	Coitarche <18 y
In utero DES exposure	History of gonorrhea	Past use of IUD
Current use of IUD	History of chlamydia	History of threatened abortion
		Nontubal surgery
		Prior cesarean section

DES: Diethylstilbestrol; PID: Pelvic inflammatory disease; IUD: Intrauterine device.

Results

A total of 63 patients diagnosed as ectopic pregnancy according from ICD-10 codes, between 2002 and 2007 in the Mediacil® database program were enrolled to the study. In the study period the total number of patients recorded with obstetrical ICD-10 codes (O.00-O.99) was 1851. The incidence of ectopic pregnancy in our patient population was 3.4% consequently.

The mean age of the patients was 29.9±5.3 (min 21- max 44). The most common symptom was abdominal pain (25 patients, 39.7%). The other presenting symptoms were as follows: 22 patients (34.9%) with vaginal bleeding, 16 patients (25.4%) with groin pain and 4 patients (6.3%) with syncope (Table 2).

9.5% (6 patients) of the ectopic pregnancy patients, evaluated in the emergency department had unstable vital signs (Table 2). Five of these unstable patients were presented with abdominal pain and one patient was presented with syncope.

The risk factors for ectopic pregnancy were searched retrospectively from the patients' records. The high risk factors were positive in 20.6% of the patients, 27% of the patients had moderate risk factors and 52.4% of the patients had weak or non associated factors (Table 2). History of previous ectopic pregnancy were the most seen risk factor among the high risk factors (n=12, 19%). The prevalence of other risk factors is displayed in Table 3.

The patients with unstable vital signs (6 patients) were grouped according to risk factors. Two patients had high risk factors, one patient had moderate risk factors and three patients had weak or non associated factors.

The treatments carried out for ectopic pregnancy patients can be seen in Table 2. Salpingectomy-salpingostomy was the most preferred treatment in 34 patients (54%).

Table 2. *The demographics of the ectopic pregnancy patients.*

Variable	Number of patients	(%)
Presenting symptoms		
Abdominal pain	25	39.7
Vaginal bleeding	22	34.9
Groin pain	16	25.4
Syncope	4	6.3
Vital signs		
Stable	57	90.5
Unstable	6	9.5
Risk factors		
None-Weak	33	52.4
Moderate	17	27
High	13	20.6
Treatment		
Medical treatment	19	30.2
Salpingectomy-salpingostomy	34	54
Laparotomy	6	9.5
Patients refused the treatment	4	6.3

Table 3. *Prevalence of risk factors in the study subjects.*

High	n (%)	Moderate	n (%)	None-Weak	n (%)
Previous ectopic pregnancy	12 (19)	History of PID	4 (6.3)	Outpatient treatment	0
Previous tubal	0	History of infertility	4 (6.3)	Sexual partners >1	0
History of tubal ligation	0	Smoking	19 (30.2)	Coitarche <18 y	0
In utero DES exposure	0	History of gonorrhea	0	Past use of IUD	0
Current use of IUD	1 (1.6)	History of chlamydia	0	History of threatened abortion	8 (12.7)
				Nontubal surgery	0
				Prior cesarean section	0
Total	13 (20.6)		24 (38.1)		8 (12.7)

Since the hCG levels were studied with urine strip test in 2002 and 2003, 12 patients were diagnosed as positive in strip test. Serum hCG levels were studied after 2004 and 51 patients were diagnosed with positive serum hCG levels.

The relation between the gestation week according to last menstruation date and serum hCG levels of 51 patients diagnosed as ectopic pregnancy with serum hCG levels can be seen in Fig. 1.

Discussion

The incidence of ectopic pregnancy in the literature is 1-2%.[1,2,6] Ectopic pregnancy incidence in our study was found to be 3.4%. This percentage may be considered relatively higher considering the levels in the literature; we think that this is caused by the fact that our hospital being the largest regional hospital, and all complicated pregnancies are referred to our hospital despite having pregnancy follow up in any other hospital.

The classic triad of abdominal pain, amenorrhea, and vaginal bleeding should always alert the clinician to evaluate for an ectopic pregnancy. Unfortunately the diagnosis may be quite challenging because the presentation of an ectopic pregnancy can vary significantly. In our study, the percentage of ectopic pregnancy patients who presented with abdominal pain was 39.7%, irregular vaginal bleeding 34.9%, groin pain 25.4%, and syncope 6.3%.

Early diagnosis can reduce the mortality and morbidity associated with ectopic pregnancy. Following the history and physical examination, the two most important diagnostic tests in evaluating for an ectopic pregnancy are ultrasound and high hCG levels. The sensitivity and specificity of combining these tests has been reported to range from 95% to 100%.[7-9] All patients in our study were diagnosed by hCG levels and ultrasound studies.

Ruptured ectopic pregnancy accounts for 10 to 15 percent of all maternal deaths.[1,2] For this reason all female patients

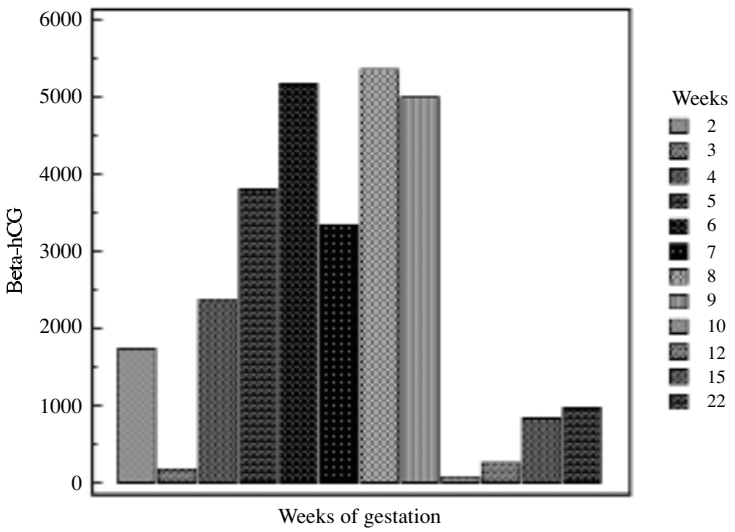

Fig. 1. *The relation between Serum b-hCG levels and gestation week.*

in childbearing age, with unstable vital signs and with or without peritoneal irritation findings should be evaluated for ruptured ectopic pregnancy. From 63 study patients, 12 (19%) had ruptured ectopic pregnancy and none of them died. Six of them (50%) had unstable vital signs and 2 of them (16.7%) presented to emergency department with syncope.

In a recent study by Sindos et al.[10] evaluating the risk factors in ruptured ectopic pregnancy, previous history of ectopic pregnancy and parity found to be related with ectopic pregnancy rupture. From the 63 patients in our study, 20.6% of them had high risk, 27% of them had moderate risk and 52.4% had low risk.

The priority for ectopic pregnancy treatment is the patient's clinical stability. Medical treatment choices can be useful if the patient is stable. The most known and used medical treatment is methotrexate. The other alternatives are folic acid antagonists, hyperosmolar glucose, prostaglandins, and mifepristone.[11] Nineteen patients (30.2%) had been treated with methotrexate in our study. If the patient is unstable or not suitable for medical treatment, laparotomy with salpingectomy is considered to be the gold standard. However with the availability of minimally invasive technology and increasing physician skills, laparoscopy is now the treatment of choice.[12] Thirty four patients (54%) had surgical treatment in our study.

Conclusion

The most common emergency department symptoms of ectopic pregnancy are abdominal pain and vaginal bleeding. Especially the patients with previous ectopic pregnancy are risky for a recurrent ectopic pregnancy. All female patients in bearing age disregarding the vital signs should be evaluated for an ectopic pregnancy.

References

1. Tenore JL. Ectopic pregnancy. *Am Fam Physician* 2000;61:1080-8.
2. Della-Giustina D, Denny M. Ectopic pregnancy. *Emerg Med Clin North Am* 2003;21:565-84.
3. Buckley RG, King KJ, Disney JD, Gorman JD, Klausen JH. History and physical examination to estimate the risk of ectopic pregnancy: validation of a clinical prediction model. *Ann Emerg Med* 1999;34:589-94.
4. Mukul LV, Teal SB. Current management of ectopic pregnancy. *Obstet Gynecol Clin North Am* 2007;34:403-19, x.
5. Olsson T, Terent A, Lind L. Rapid Emergency Medicine Score can predict long-term mortality in nonsurgical emergency department patients. *Acad Emerg Med* 2004;11:1008-13.
6. Tay JI, Moore J, Walker JJ. Ectopic pregnancy. *BMJ* 2000;320(7239):916-9.
7. Aleem FA, DeFazio M, Gintautas J. Endovaginal sonography for the early diagnosis of intrauterine and ectopic pregnancies. *Hum Reprod* 1990;5:755-8.
8. Ankum WM, Van der Veen F, Hamerlynck JV, Lammes FB. Laparoscopy: a dispensable tool in the diagnosis of ectopic pregnancy? *Hum Reprod* 1993;8:1301-6.
9. Cacciatore B, Ylöstalo P, Stenman UH, Widholm O. Suspected ectopic pregnancy: ultrasound findings and hCG levels assessed by an immunofluorometric assay. *Br J Obstet Gynaecol* 1988;95:497-502.
10. Sindos M, Togia A, Sergentanis TN, Kabagiannis A, Malamas F, Farfaras A, et al. Ruptured ectopic pregnancy: risk factors for a life-threatening condition. *Arch Gynecol Obstet* 2008 Sep 2.
11. Barnhart KT, Gosman G, Ashby R, Sammel M. The medical management of ectopic pregnancy: a meta-analysis comparing "single dose" and "multidose" regimens. *Obstet Gynecol* 2003;101:778-84.
12. Hajenius PJ, Mol F, Mol BW, Bossuyt PM, Ankum WM, van der Veen F. Interventions for tubal ectopic pregnancy. *Cochrane Database Syst Rev* 2007;(1):CD000324.