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Original article

Analysis of ectopic pregnancies admitted to emergency department



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ABSTRACT

Objectives: Ectopic pregnancy (EP) may cause significant morbidity and mortality. In this study, we aimed to evaluate the demographic characteristics, presence of risk factors and diagnostic parameters of the patient with EP and predicting parameters for ruptured EP.

Methods: Patients who presented to emergency department (ED) and diagnosed as EP within one year were included to the study. The demographic characteristics, β -human chorionic gonadotropin (β -HCG) levels, transvaginal ultrasonography (TVUSG) findings, treatment protocols, pathology reports and hemoglobin levels at the time of admission to ED were obtained from patient files and hospital automation system and statistical analysis was performed.

Results: Total 35 patients were included to the study. The mean age of the patients was 30 ± 5.6 years. Among the patients, 46% had a history of caesarean section (C-section). The complaints of the patients at presentation, their age, gestational week and the β -HCG levels were found to be inefficient in predicting ruptured EPs. TVUSG was found statistically significant in terms of demonstrating ruptures in EP. The ratio of salpingectomies was observed to be higher in the surgical treatment of ruptured EPs.

Conclusions: C-section was most frequently seen with EP. There is no absolute diagnostic parameter for predicting ruptured EPs and TVUSG may be a clue for diagnosis. The final diagnosis is made through surgery.

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1. Introduction

Ectopic pregnancy (EP) is defined as the implantation of the fertilized ovum outside the uterine cavity. This condition occurs in 1–2% of pregnancies. Unless diagnosed and treated at an early phase, EP may cause significant morbidity and mortality.¹ The most frequently observed site for EP is the fallopian tubes, although atypical sites such as the cervix, ovaries, abdomen or the caesarean section (C-section) scar may be observed in less than 10% of the patients.² Patients most frequently present to the emergency department (ED) with abdominal pain and vaginal bleeding, rarely syncope, hemorrhagic and hypovolemic shock, shoulder pain, and urinary or gastrointestinal complaints. The β -human chorionic gonadotropin (β -HCG) test and transvaginal ultrasonography

(TVUSG) are used for the diagnosis of EP. Both tests are inconclusive in the early phase of the pregnancy and sometimes a surgical approach is required for the differential diagnosis.^{3,4}

Among ectopic pregnancies, 18%–35% of patients lead to ruptures.^{5,6} The clinical manifestation of ruptured EP may begin very insidiously and may lead to life-threatening massive hemoperitoneum requiring emergency surgery. Sometimes the only method for the differential diagnosis is laparoscopy.⁷ Although the β -HCG test and TVUSG are used for the diagnosis of ectopic pregnancy, they are not adequate for the diagnosis of ruptured EPs.^{3,8,9}

Knowing the probable risk factors, reliability of the diagnostic parameters, and the possibility of a rupture and finally diagnosing the EP in the ED is of utmost importance. Confusion about the diagnosis of ectopic pregnancy and the lack of predefined criteria for an early diagnosis of ruptured EP present serious challenges for both the patient and the doctor.⁸

The aim of this study is to evaluate the demographic characteristics, diagnostic parameters and applied treatments of the patients with ectopic pregnancies who present to ED in order to conduct a risk stratification and define the prognostic factors.

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2. Material and Methods

The study was planned in a retrospective manner. The patients who presented to ED – which has an annual turnover of 200,000 patients – between 1 January 2013 and 31 December 2013 were screened. Total 1535 female patients aged 18 years and above who had various symptoms and were found to have positive β -HCG tests were detected. Of these patients, 35 patients who were prediagnosed ectopic pregnancy according to β -HCG and TVUSG findings were included to the study.

The demographic characteristics, hemoglobin and β -HCG levels at the presentation to ED, transvaginal ultrasonography (TVUSG) findings, treatment protocols, and pathology reports of the remaining 35 patients were recorded from the patient files. The 35 patients included in the study were classified according to Barnhart's "Risk Scoring for Nonviable Pregnancy of Unknown Location" and the risk stratification was performed (Table 1).¹⁰ The 3rd stage shock accompanied by hypotension and tachycardia was defined as hemodynamic instability.¹¹

The statistical analysis of our data was performed using the "SPSS for Windows Version 16.0" software. Spearman's correlation and the Chi-square and the Mann–Whitney U tests were employed in the analysis.

3. Results

Among the patients who presented to ED within one year, 35 patients were diagnosed with EP. The causes for seeking medical assistance were abdominal pain in 20 patients (57%), abdominal pain with vaginal bleeding in 14 (40%) patients, and syncope in 1 patient (3%). The mean age of the patients was 30 ± 5.6 years and the age range varied between 21 and 42 years. Among the patients, 7 (20%) were primigravida.

In terms of patient operation history, 16 patients (46%) out of 35 had a history of C-section, 2 patients (6%) had previously experienced EP, 1 patient (3%) had a tubal ligation, 8 patients (23%) had abortion and/or curettage, and 2 patients (6%) had a history of intrauterine device (IUD) and 16 (45.7%) had no history of abdominal surgery.

During the presentation to ED, 33 out of 35 patients had stable vital signs, while 2 were hemodynamically unstable. The hemoglobin values of all the patients were over 10 g/dl at presentation (Normal value: 11.5–16 g/dl).

The mean gestational age of the patients according to the last period was 6 ± 1.5 weeks, with a minimum of 3 weeks and a maximum of 10 weeks. The mean blood β -HCG value was 3560 ± 4137 mU/ml, with a minimum of 17 and maximum of 19,900 mU/ml (Normal value: 0–10 mU/ml).

Table 1
Scoring System for nonviable pregnancies.

	Variable	Numeric score
1	Age	
	18<	+1
	38>	+3
2	History of ectopic pregnancy	
	1	+2
	2 or more	+3
3	Bleeding	+4
4	History of miscarriage	-1
5	BHCG>2000 mIU/ml	-1

The total score may vary between -2 and 10. Total scores between -1 and -2 indicate low risk, scores between 0 and 4 show medium risk and scores ≥ 5 point to a high risk.

The diagnosis of ectopic pregnancy in the 35 patients included in the study was made through β -HCG and TVUSG. The TVUSG during the presentation to ED were conducted by a gynaecologist-obstetrician or a 3rd year gyn-obs. resident. The TVUSG findings are presented in Table 2.

Among the 35 patients, 25 (71.6%) underwent laparoscopic surgeries, 6 (17%) were treated through laparotomies, and 4 (11.4%) received medical treatment with methotrexate. Sixteen (51.6%) out of the 31 patients who were surgically treated have undergone salpingectomies, while 14 (45.1%) have undergone salpingostomy. The location of EP could not be discovered in 1 patient. The pathology results of the 31 patients referred for surgery are presented in Table 3.

The risk classification of the 35 patients according to Barnhart's scoring revealed that 2 (5.7%) were high-risk, 19 (54.3%) were moderate risk, and 8 were (22.9%) low risk patients. The same classification indicated no risk in 6 patients (17.1%).

The diagnosis of ruptured EP was made by the pathology. Among the 31 patients who had undergone surgery, ruptured EP was observed in 11 patients (35.5%). The complaints of the patients at presentation, their age ($p = 0.49$), gestational week ($p = 0.19$) and the β -HCG levels ($p = 0.23$) were found to be inefficient in predicting ruptured EP. When the detection of pelvic or abdominal fluid in the TVUSG was taken as an indication of a rupture, TVUSG was observed to be statistically significant in terms of demonstrating ruptures in EP ($p = 0.019$). The ratio of salpingectomies was observed to be higher in the surgical treatment of ruptured EPs ($p = 0.002$).

4. Discussion

The predisposing factors, risk stratification and the factors affecting the prognosis in ectopic pregnancy are yet to be cleared.⁸ Although various risk factors have been blamed for EP, 50% of the patients are free of any risks.¹² According to the study by Ankum et al, women with a history of ectopic pregnancy, tubal surgery, or tubal pathologies are under a high risk, while those with previous genital infections, infertility, and multiple sexual partners are under moderate risk for EP.¹³ In the study by Barnhart et al, previous EP has been found as the strongest risk factor and pelvic inflammatory disease was the weakest risk factor, while previous C-section, nontubal pelvic surgery, or cervical infections were observed to be irrelevant in terms of ectopic pregnancy.¹² In a study conducted in Papua New Guinea, sexually transmitted infections were found to be the greatest risk factor for tubal pregnancies.¹⁴ Age, use of IUDs, previous abdominal or tubal surgery, C-section, and previous ectopic pregnancy which were found as a risk factors by studies were investigated in our study patients.

Tubal damage is regarded as the most prominent factor in the pathogenesis of EP. According to this hypothesis, the myoelectrical activity of the fallopian tubes are disturbed with advancing age and the risk for ectopic pregnancy may increase.³ In our study, similar ratios of ectopic pregnancy were observed during the 2nd and 3rd decades of life, while these ratios diminished in the 4th decade.

Table 2
TVUSG findings and pathology results.

TVUSG	Number of patients
EP	12 (34.3%)
Pelvic fluid	10 (28.6%)
Fluid in the adnexa + EP	11 (31.4%)
Intra-abdominal fluid	1 (2.9%)
Intra-abdominal fluid + EP	1 (2.9%)
Total	35 (100%)

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