



FACTOR INVOLVED IN RUPTURE ECTOPIC PREGNANCY

Obstetrics & Gynaecology

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KEYWORDS

INTRODUCTION / BACKGROUND

What is ectopic pregnancy?

Ectopic Pregnancy is defined as the plantation of the embryo outside the uterus and is also considered as the most life threatening condition supposed to be a gynaecological emergency. In cases of naturally conceived pregnancy it has been seen that worldwide about 1-2% of the plantations of the embryo are ectopic.^[1,2]

It has been seen that about 10-15% of all the maternal deaths are due to ectopic pregnancy remains to be the main cause leading to the most amounts of maternal mortality in the first trimester.^[3]

In case of an Ectopic Pregnancy it is important to understand that, Ectopic Pregnancies do not develop into a healthy pregnancy or a child rather it poses severe risk to the mother and can be a cause of maternal mortality as well. In case of ectopic pregnancy various complications can arise like haemorrhage, rupture and infection which can be a high risk factor for the mother thus a proper medical treatment must be provided to avoid such complications. In patients who have had a previous ectopic pregnancy, more than 30% suffer from infertility and about 5-20% develop recurrent ectopic.^[4]

Prevalence:^[5]**Incidence:** 19 cases per 1000 pregnancies**Fatality Rate:** 4 cases per 10,000 ectopic pregnancies

Ruptured ectopic is leading cause of maternal death, accounts for 10% to 15% of maternal deaths.

Pathophysiology and Risk Factors:

The exact pathophysiology of ectopic pregnancy remains to be unknown but over the years scientists have come-up with various possibilities that could lead to an ectopic pregnancy.

The four main possibilities are as follows:

1. An anatomic obstruction to the passage of the zygote
2. An abnormal conceptus
3. Abnormalities in the mechanisms responsible for tubal motility
4. Trans-peritoneal migration of the zygote.

It has been seen that most of the cases of ectopic pregnancy is mainly due to the anatomic distortion and obstruction of the fallopian tube.

PID, salpingitis isthmica nodosa,^[6] tubal endometriosis, or postsurgical fibrosis^[7] could be the main reason of obstruction. Scarring of the endosalpinx could lead to diverticuli formation, in which the zygote could be trapped, or to simple obstruction of the tubal passage. In about 30-50% of the cases of ectopic pregnancy an anatomic cause could be the reason, which has been proven in various histologic and gross evidences.^[8,9]

Contradicting to this, some researchers that studied the fallopian tube found that pathologies like fibrosis, chronic inflammation of endometriosis were not associated with ectopic pregnancy.^[10]

Thus, Functional causes like defective conceptus, abnormalities in the motility of the fallopian tube, or trans peritoneal migration should also be given equal importance.

An abnormal conceptus could theoretically result in defective migration of premature implantation in an ectopic site. This possibility has been investigated by examining the chromosomal constitution of

ectopic gestations. In a study by Elias and his co-workers it was seen that the incidence of chromosomal abnormalities in ectopic pregnancies is no different from that in intrauterine pregnancies.^[11] Also in a case-control study by Fedele and colleagues,^[12] it was seen that the risk of ectopic pregnancy (after adjustment for maternal age and parity) to be fourfold greater in women with a history of recurrent spontaneous abortion.

Tubal motility seems to be influenced by the hormonal milieu. The suspicion that some cases of ectopic pregnancy may be due to endocrine abnormalities stems from clinical observations that have suggested an association in patients using a progesterone-only pill, an IUD,^[13,14,15] or human menopausal gonadotropins for ovulation induction.^[16,17] It was noticed that high estrogen levels in cases of hyperstimulation with human menopausal gonadotropins interfere with tubal transport. It could also be due to an increased number of eggs are released (*superovulation*) in hyperstimulated patients, resulting in an increased risk of ectopic implantation.

In the contrary subnormal estrogen levels subsequent to vigorous exercise and dietary fads have been hypothesized to contribute to increased ectopic rates in today's more health-conscious society.^[18]

Risk Factors:^[19]

1. Previous pelvic surgery
2. Contraception
3. Transperitoneal migration
4. Diethylstilbestrol exposure
5. Endometriosis
6. Infection
7. Infertility
8. Maternal age
9. Maternal race
10. Hormonal factors
11. Previous ectopic pregnancy
12. Previous spontaneous abortion
13. Alterations in tubal physiology
14. Assisted reproductive technology
15. Uterine curettage

Diagnosis:

Since it has been previously seen that ectopic pregnancy is a life threatening condition, a proper diagnosis is a crucial step in the treatment line. It has been seen that there is no proper correlation of the signs and symptoms with the diagnosis. To confuse the diagnosis further, a normal menstrual history is reported in approximately 50% of patients with an ectopic pregnancy. A urine pregnancy test may occasionally be negative. Though rarely seen, the combination of a uterine decidual cast and a positive pregnancy test is virtually pathognomonic of an ectopic pregnancy.^[20]

Ruptured Tubal Pregnancy**I. INTRODUCTION:**

In 95% of ectopic pregnancy instances, the fallopian tube is the most frequent extrauterine location of embryo implantation. The fallopian tube is put under pressure as the embryo connects to it and begins to grow inside the tube. As the embryo grows, its mass also increases. When the embryo eventually outgrows the tubal lumen, the tubule ruptures, causing profuse bleeding and a potentially fatal situation.^[21]

II. Factors Affecting Ruptured Tubal Pregnancy:

The ability to recognize women at risk for this potentially fatal illness may be aided by having understanding of the risk variables connected

to ruptured tubal pregnancies. As a result of surgical and medical advancements including methotrexate injection and laparoscopic management, we have witnessed a decline in EP-related morbidity, expenses, and hospitalizations. Although it has long been understood that significant morbidity and mortality are caused by EP. Heart rate, blood pressure, hCG levels, and hemoglobin levels are some of the often used diagnostic indicators of a ruptured tubal pregnancy, however they are not always sufficient to predict it. Therefore, understanding the risk factors linked to a ruptured tubal pregnancy may be useful in identifying women who can receive treatment.^[5]

1. Previous Ectopic Pregnancy:

Women who have had previous ectopic pregnancies are more likely to experience tubal rupture if their second pregnancy is likewise ectopic. Patients with a history of ectopic pregnancies have been observed to have damaged fallopian tubes, which may increase risk and difficulty.

There are two main causes of abnormal fallopian tubes in women who have previously experienced ectopic pregnancies.^[22]

When the fertilized embryo attaches to the endometrial lining of the fallopian tube, ectopic pregnancy typically results. Therefore, it is possible that the fallopian tube itself has an anatomical flaw, such as scarring of the tube, which prevents the embryo from passing and causes the embryo to become stuck in the tube before it reaches the uterus.

The other possibility is when the fallopian tubes were healthy before to the previous ectopic pregnancy but the tubal pregnancy significantly damaged the inner lining of the tube.

In their retrospective clinical research of ectopic pregnancy patients, Latcaw et al. (2005) discovered that those who had had prior ectopic pregnancies have a markedly increased risk of developing a tubal rupture.^[23]

In their study, Roussos et al. (2000) also came to the conclusion that women who have had full-term pregnancies and those with a history of ectopic pregnancies are more likely to experience tube rupture. These findings imply that ectopic pregnancy is less likely in these situations.^[24]

Therefore, it's crucial to take into account previous ectopic pregnancies as a risk factor for tubal rupture.

2. Treatment of Infertility:

Since fertility procedures increase the chance of ectopic pregnancy and because one ectopic pregnancy increases the risk of another, ectopic pregnancy treatment and how it impacts fertility are complicated matters.

It has been seen that when treating infertility, surgical equipment are occasionally pushed through the fallopian tubes, which could cause damage to the tube and cause it to rupture during a tubal pregnancy. It could also be the reason an ectopic pregnancy develops.

3. Tubal Problems or Diseases:

Most ectopic pregnancies are assumed to be the result of prior fallopian tube injury. The natural movement of the fertilized egg through the tube and into the uterus, where a healthy pregnancy takes place, is impeded by scarring in the tube.

Pelvic inflammatory diseases can damage the fallopian tube lining and infect the tubes, which makes it more challenging for eggs to pass through. A ruptured tube may result from a trapped or growing fertilized egg, which could sometimes result in serious, potentially fatal internal bleeding.^[25]

4. Levels of Beta-HCG

Within two weeks of fertilization, trophoblasts release -hCG in a typical intrauterine pregnancy, with blood levels reaching 50–300 mIU/mL.^[26] When the serum -hCG concentration is greater than or equivalent to 25 mIU/mL, the urine pregnancy test will typically become positive.^[27] The hCG level in an early, healthy intrauterine pregnancy increases roughly every 48–72 hours until 60–90 days after conception. Serum -hCG levels will only rise similarly to those of typical intrauterine pregnancies in 15% of women with ectopic pregnancies.^[28] The degradation of trophoblasts, which results in the

termination of hCG synthesis, is the mechanism most likely to account for low hCG levels in ectopic pregnancy.^[28]

According to earlier studies, -hCG levels above 1750 mIU/mL were linked to a greater odds ratio (OR) for ruptured ectopic pregnancy.^[30] Another study revealed a link between high levels of hCG and a higher risk of ectopic pregnancy rupture.^[2]

One of the research also revealed that -hCG levels did not accurately predict the probability of ruptured ectopic pregnancies.^[21]

In an analysis of 716 hospitalized patients with ectopic pregnancy, a single very low serum level (100 IU/L) has been seen to be comforting; yet, 29% of those with such a level were found to have tubal rupture during laparoscopy.^[20] A wide range of -hCG values were comparable in terms of the risk of tubal rupture. In a different investigation, women with serum levels ranging from 10 to 189 720 IU/L experienced 38 cases of rupture.^[29] Therefore, unless the serum hCG level is less than 5 IU/L, it is impossible to rule out ectopic pregnancy or forecast the risk of rupture from a single measurement.^[30]

5. Obesity:

In a recent study, overweight women had a 50% higher risk of having an ectopic pregnancy, which was presented at the American Society for Reproductive Medicine meeting. (a pregnancy outside of the uterus, usually in the fallopian tube).

A body mass index of more than 26 was found to increase the risk of fallopian tube rupture in a study by Fukami et al. (2016).^[31]

6. Haemoglobin Levels:

When an ectopic pregnancy ruptures, blood is lost, which causes the haemoglobin levels to fall.

Low hemoglobin and hematocrit readings, together with higher gravidity at the time of admission, have been linked to an increased risk of tubal rupture, according to a 2009 study by Knafel et al.^[32]

7. Location of Ectopic Pregnancy:

A higher prevalence of ruptured ectopic pregnancies may be linked to the location of the ectopic pregnancy.

Ectopic pregnancies at the cornua and isthmus were linked to a significant frequency of ruptures, according to a prior study.^[23] 2% to 4% of ectopic pregnancies were interstitial pregnancies (IP). Due to uterine rupture and heavy bleeding, IP is typically regarded as a nonviable pregnancy and has a 2.5% mortality rate.^[33]

However, in a different study, the tube (bilaterally) was the most frequent site of ectopic pregnancy, accounting for 78% and 90% in the ruptured and unruptured groups, respectively.

Therefore, there was a higher chance of tubal rupturing during ectopic pregnancies.^[21]

8. Gestational Age:

In a study by Goksedef et al. (2011), patients with ruptured ectopic pregnancy had mean gestation (measured in weeks) that was considerably higher than patients with unruptured ectopic pregnancy. According to a logit regression analysis, amenorrhea lasting between 6 and 8 weeks and more than 8 weeks was a significant risk factor for tubal rupture.^[3]

According to a retrospective study conducted in Turkey, the chances of tubal rupture are 3.67 and 46.69, respectively, at gestational ages of 6 to 8 weeks and more than eight weeks.^[3] Other researchers found a marginally significant positive correlation between rupture and gestational age. This discovery may be explained by the fact that the size of the ectopic gestational mass typically grows with gestational age, and rupture becomes more likely when the size of the gestational mass outgrows the fallopian tube.^[34]

III. Treatment:

Unfortunately, ectopic pregnancy is not a feasible option, so medical intervention is needed to remove the embryo from the fallopian tube safely. (or wherever else it has implanted outside of the uterus). Either surgery or medicinal management are available as treatments for ectopic pregnancy. When there is no imminent risk of rupture, early

ectopic pregnancy may be treated pharmaceutically with methotrexate. If the ectopic pregnancy has ruptured, surgery is required to correct any harm. With surgery, the tube is either completely removed or just the pregnancy is taken out.

The patient might need a blood transfusion in cases of ruptured ectopic pregnancy if a significant amount of blood has been lost. Initial stabilization during emergency care may involve administering oxygen, fluids, and raising the legs above the heart. Over 95% of ectopic pregnancies occur in the fallopian tubes, and with the growth of the fetus, the pregnancy would invariably rupture without medical intervention.^[35]

CONCLUSION

Ectopic rupture is a dangerous illness that poses a high risk of mortality and morbidity for mothers. Many patients lack adequate documentation of their risk factors as well as any physical signs.

It has been observed that the majority of people with ectopic pregnancies die from tube rupture, which might result in a condition that puts the patient's life in peril.

Therefore, a thorough assessment of its risk factors is necessary to detect the rupture at an early stage and stop further loss.

List Of Abbreviations:

	Abbreviation	Full Form
1.	Beta-HCG	beta-Human Chorionic Gonadotropin
2.	MTX	Methotrexate
3.	DNA	Deoxyribonucleic Acid

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