



STUDY OF EPIDEMIOLOGICAL TRENDS AND CLINICAL PRESENTATION OF ECTOPIC PREGNANCY IN A TERTIARY CARE CENTRE

Gynecology

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KEYWORDS

INTRODUCTION :

Ectopic pregnancy (ectopic pregnancy)—that is, implantation of an embryo outside the uterine corpus, is presented as an acute emergency. It is a life and fertility threatening event, accounting for up to about 10% of all maternal mortality¹⁻⁵.

The fallopian tube is the most common site of ectopic implantation accounting for 97 percent of all ectopic pregnancies (55 percent in the ampulla, 25 percent in the isthmus, 17 percent in the fimbria). The rest 3 percent is on account of ectopic implantation in the abdominal cavity, ovary, and cervix⁶. An ectopic pregnancy may also co-exist with intrauterine pregnancy. This is called heterotopic pregnancy. It is a rare event, occurring in 1 in 30,000 pregnancies.⁷ However, the incidence increases significantly in pregnancies achieved with assisted reproductive techniques

The incidence of ectopic pregnancy has doubled or tripled, during the past two decades, in many parts of the world⁷. Ectopic pregnancy at present constitutes 1.2 to 1.4 percent of all reported pregnancies³. The diagnostic approach to the patient in the emergency department with first-trimester bleeding or pain has changed due to increases in the availability and use of hormonal markers, coupled with advances in formal and emergency ultrasonography.

The ectopic pregnancy still remains the leading cause of maternal death during the first trimester of pregnancy in developing countries^{7,8} despite undeniable progress in terms of earlier diagnosis and conservative and medical management. Furthermore, ectopic pregnancy leads to permanent sterility in 20 to 60 percent of cases and recurrence occurs in more than 20 percent^{9,10}.

Differential Diagnosis of Ectopic pregnancy*
Acute appendicitis
Miscarriage
Ovarian torsion
Pelvic inflammatory disease
Ruptured corpus luteum cyst or follicle
Tubo-ovarian abscess
Urinary calculi

The pathogenesis of ectopic pregnancy is considered multifactorial^{11,12} with incidence usually lower in women < 24 years old^{13,14}. However, post inflammatory lesions of the fallopian tubes (chronic salpingitis, salpingitis isthmica nodosa) due to an ascending infection from the lower genital urinary tract are a major etiological factor. In fact, history of previous pelvic inflammatory disease (PID) has been shown to be the strongest predictor^{15,16,17,18}.

Ectopic pregnancy is usually diagnosed in the first trimester of pregnancy. The most common gestational age at diagnosis is 6 to 10 weeks^{19,20}.

This important health issue has given rise to many epidemiologic studies aimed at identifying risk factors for ectopic pregnancy. Many women with ectopic pregnancies have one or more recognized risk factors but half of all women with ectopic pregnancy have none. The risk for ectopic pregnancy is increased tenfold for women with previous ectopic pregnancy compared to general population. The overall risk of recurrence is approximately 10% for women with previous one ectopic pregnancy and at least 25% for women having

history of two or more ectopic pregnancies. In one study, the risk of recurrence after medical treatment with Methotrexate (single dose regimen) was around 8%, after a salpingectomy was 10%, and after a linear salpingostomy was 15%.

The main risk factors for ectopic pregnancy that have been identified in several studies are pelvic inflammatory diseases and sexually transmitted diseases, particularly *Chlamydia trachomatis* infections^{21,22,23}, previous ectopic pregnancy, cigarette smoking, abdominal or pelvic surgery, and previous use of intrauterine device. Maternal age, previous spontaneous abortion, previous induced abortion, stimulation of conception cycle, delayed ovulation, and low gravidity and parity have been the subject of contradictory reports. Contraceptive methods (intrauterine device, progestagen micro pill) used at the time of conception and tubal sterilization are now considered more as preventive factors of intrauterine pregnancy than as risk factors of ectopic pregnancy.

Increased sensitivity of serum β -hCG immunoassay and improved quality of transvaginal ultrasounds (US) allow early detection and conservative management of ectopic pregnancy. Abnormal pregnancies are associated with an increase of hCG at a rate < 66% in 48 hours, but 15% of normal pregnancies may have an abnormal hCG rise; further, abnormal rise did not differentiate between spontaneous abortion and ectopic pregnancy. The same problems hold true when using single Serum Progesterone in diagnosing ectopic pregnancy. The optimal range of serum progesterone (9 to 14 ng/mL; conversion factor to SI unit, 3.18) discriminates between abnormal and normal pregnancies to a test efficiency of only 80%, and, again, spontaneous and ectopic pregnancies could not be distinguished.

Barnhart et al²⁴ described a diagnostic algorithm consisting of clinical examination, quantitative serum β -hCG, and transvaginal ultrasound. This protocol diagnosed ectopic pregnancies with a sensitivity of 100% and a specificity of 99%.

The traditional treatment of ectopic pregnancy is laparotomy and salpingectomy. The conservative approach includes surgical and nonsurgical management. The surgical approach is usually linear salpingostomy, which allows the fallopian tube to be preserved. Among medical treatments, the most popular is IM methotrexate injection. Local injection of various substances, including methotrexate, prostaglandins, hyperosmolar glucose, potassium chloride, and RU486 also have been attempted. Finally, expectant management that involves follow-up with serial serum hCG levels and ultrasound is another option.

METHODOLOGY :

The study covers a period of 3 months, from 1 January 2016 to 31 March 2016, of patients admitted and treated for ectopic pregnancy in the Department of Obstetrics and Gynaecology of BHU. The age span of the patients included in the study was 15–45 years. The catering area covers patients coming from Uttar Pradesh, Bihar, Madhya Pradesh, Chhattisgarh.

CRITERIA FOR DIAGNOSIS

Ectopic pregnancy was suspected when the patient complained of low abdominal pain and had subjective symptoms of early pregnancy (< 6–7 weeks) with a positive urine human chorionic gonadotropin (hCG) test and on examination there was cervical motion tenderness with or

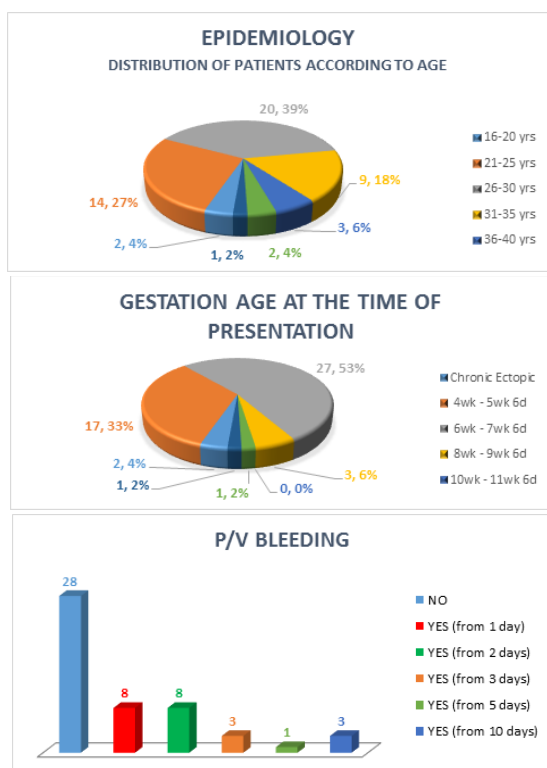
without positive culdocentesis. The suspicion of ectopic pregnancy was further enhanced if the patient had a previous history of ectopic pregnancy, PID, had undergone surgery of the lower abdomen or the fallopian tubes, used an intrauterine contraceptive device (IUCD), history of ATT intake, had undergone in vitro fertilization (IVF), used progesterone only preventive pills, or had clinical evidence of vaginal bleeding. Final diagnosis was made by ultrasonography and β -hCG titre, but the management does not depend upon USG & hCG titre if the patient is presenting in shock along with strong clinical suspicion of ectopic pregnancy.

MANAGEMENT

Patients with hemodynamic instability and or with hemoperitoneum were managed surgically and were shifted for exploratory laparotomy after arranging adequate blood and blood products. Patients who were hemodynamically stable and fulfilled the criteria of medical management and were willing for follow up were managed medically.

RESULTS:

In the study, most of the patients (20) were in the age group of 26-30 years which is comparable with other studies. Most of the patients are multiparous and all cases presenting had complaint of pain abdomen for 1 to 3 days duration mostly at 6 weeks to 6 weeks 6 days gestational age.



23 patients presented with history of bleeding p/v along with pain abdomen. Out of 51 patients, 12 patients presented in shock. Two patients had history suggestive of chronic ruptured ectopic pregnancy. In 31 cases there was ruptured ampullary ectopic while in 10 cases it was interstitial (cornual) ruptured ectopic pregnancy and in 6 cases isthmus part was involved. Only 1 case had ruptured ovarian ectopic pregnancy.

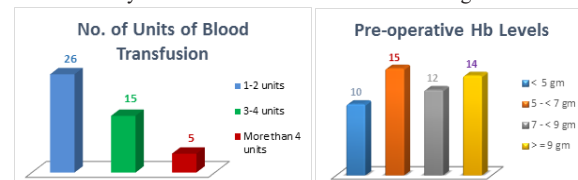
RISK FACTORS

In the study group mainly the risk factors encountered were infertility treated patients, patients with history of ATT intake, history of previous ectopic, history of smoking, history of p/v discharge (PID), history of D&C's, history of pelvic surgeries, history of appendectomy, history of tubal ligation, use of progesterone only pills or OCP's, use of IUCD.

Risk Factors	
Infertility treated	10
History of ATT Intake	9
History of Previous Ectopic	3

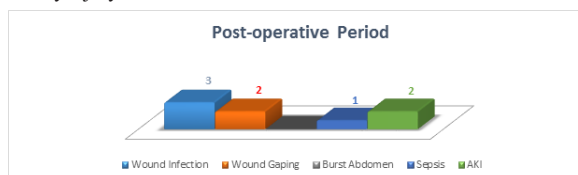
History of Smoking	3
History of p/v Discharge (PID)	7
Use of IUCD	5
History of Tubal Ligation or Pelvic Surgery	3
Use of OCPs	3
History of D & C	19

In 5 cases more than 4 units blood transfusion was required while in most cases only 1 to 3 units blood transfusion was enough.



POST-OPERATIVE PERIOD

The post operative period was mostly uneventful except for in some cases there was wound infection, wound gaping, sepsis and acute kidney injury.



DISCUSSION:

Ectopic pregnancy is generally considered to be most common in women > 25 years of age²⁵ which was confirmed in the present study. Ectopic pregnancy is usually diagnosed in the first trimester of pregnancy. The most common gestational age at diagnosis is 6 to 10 weeks. In our study 53% patients were between 6 to 8 weeks gestational age at the time of presentation.

Ectopic pregnancy has about the same frequency across a wide range of maternal ages and ethnic origins. Documentation of risk factors^{26,27,28} is an essential part of history-taking, and asymptomatic clinic patients with risk factors may benefit from routine early imaging. However, more than half of identified ectopic pregnancies are in women without known risk factor^{29,30}.

Poor menstrual hygiene leading to pelvic inflammatory disease is very common cause of ectopic pregnancy in young women. In our study 3 unmarried girls presented with ruptured ectopic which reflects the unsafe sexual practices and Pelvic infection in these group. Awareness regarding menstrual hygiene and sex education can help reduce the incidence of ectopic pregnancy further by decreasing the associated pelvic inflammatory disease in young women and lowering the morbidity and mortality significantly.

In this study, 65% of the ruptured ectopic was in ampullary region of the tube, 21% in cornual region, 12% in isthmus and 2% in ovary which is comparable to other studies.

Due to availability of ultrasonography coupled with sensitive β -hCG levels early diagnosis and treatment has decreased the mortality and morbidity which is evident from our study where there was no mortality due to ruptured ectopic and very few post operative complications due to timely management of the patients.

CONCLUSION:

Ectopic pregnancy is a common and serious problem, with a significant morbidity rate and the potential for maternal death. Many patients have no documented risk factors and no physical indications of ectopic pregnancy. Ultrasonography is the initial investigation that should be done in an Ectopic pregnancy patient with 1st-trimester bleeding or pain; indeterminate results may be clarified by measurement (single or serial) of the serum β -hCG and progesterone concentrations.

Risk factors most strongly associated with ectopic pregnancy include previous ectopic pregnancy, tubal surgery, and poor menstrual hygiene. A history of genital infections or infertility and current smoking increase risk. Contraceptive use reduces the annual risk for intrauterine and ectopic pregnancy; however, previous intrauterine device use may increase risk.

Management is dictated by the clinical presentation, serum β -hCG levels and transvaginal ultrasound findings. MTX, as a single intramuscular injection, can be given to women who are hemodynamically stable and compliant and have an initial serum β -hCG concentration of less than 5000 IU/L and no ultrasound evidence of fetal cardiac activity.

Patients who do not meet these criteria should be treated surgically, in most cases by laparoscopy. Surgical treatment is particularly appropriate for women who are hemodynamically unstable or unlikely to be compliant with post-treatment monitoring and those who do not have immediate access to medical care. The choice of treatment should be guided by the patient's preference, after a detailed discussion about monitoring, outcome, risks, and benefits of the 2 approaches.

References

1. Beral V. An epidemiological study of recent trends in ectopic pregnancy. *Br J Obstet Gynaecol* 1975;82:775-82.
2. Westrom L, Bengtsson LPH, Mardh P-A. Incidence, trends and risks of ectopic pregnancy in a population of women. *BMJ* 1981;282:15-18.
3. Shiono PH, Harlap S, Pelleginn F. Ectopic pregnancies: rising incidence rates in northern California. *Am J Public Health* 1982;72:173-5.
4. Centers for Disease Control. Ectopic pregnancy—United States, 1981-1983. *MMWR* 1986;35:289-91.
5. Chow W-H, Dahng JR, Cates W Jr, et al. Epidemiology of ectopic pregnancy. *Epidemiol Rev* 1987;9:70-94.
6. Della-Giustina D, Denny M. Ectopic pregnancy. *Emerg Med Clin North Am* 2003;21:565-84.
7. Michal M, Marian M, Marek M, et al; Heterotopic pregnancy in the absence of risk factors—diagnostics difficulties. *Ginek Pol* 2011 Nov82(11):866-8.
8. Atrash HK, Hughes JM, Hogue CJR. Ectopic pregnancy in the United States, 1970-1983 CDC surveillance summaries. *MMWR* 1986;35:29-37.
8. Chavkin W. The rise of ectopic pregnancy. Exploration of possible reasons. *Int J Gynaecol Obstet* 1982;20:341-50.
9. Hughes GJ. Fertility and ectopic pregnancy. *Eur J Obstet Gynecol Reprod Biol* 1980;10:361-5.
10. Sandvei R, Ulstein M, Wollen AL. Fertility following ectopic pregnancy with special reference to previous use of an intra-uterine contraceptive device (intrauterine device). *Acta Obstet Gynecol Scand* 1987;86:131-5.
11. Pisarska MD, Carson SA, Buster JE. Ectopic pregnancy. *Lancet* 1998;351:1115-20.
12. Ankum WM, Mol BWJ, Van der Veen F, et al. Risk factors for ectopic pregnancy: a meta-analysis. *Fertil Steril* 1996;65:1093-9.
13. Meirik O. Ectopic pregnancy during 1961-78 in Uppsala county, Sweden. Impact of demographic factors on overall incidence. *Acta Obstet Gynecol Scand* 1981;60:545-8.
14. Hadgu A, Koch G, Westrom L. Analysis of ectopic pregnancy data using marginal and conditional models. *Statist Med* 1997;16:2403-17.
15. Westrom L, Bengtsson L, Ph, Mardh P-A. Incidence, trends and risks of ectopic pregnancy in a population of women. *BMJ* 1981;282:15-18.
16. Clark K, Baranyai J. Pelvic infection and the pathogenesis of tubal ectopic pregnancy. *Aust NZ J Obstet Gynaecol* 1987;27:57-60.
17. Ankum WM, Mol BWJ, Van der Veen F, et al. Risk factors for ectopic pregnancy: a meta-analysis. *Fertil Steril* 1996;65:1093-9.
18. Hadgu A, Koch G, Westrom L. Analysis of ectopic pregnancy data using marginal and conditional models. *Statist Med* 1997;16:2403-17.
19. Brunham RC, Binns B, Mac Dowell J, et al. Chlamydia trachomatis infection in women with the intrauterine device: a study of seventy cases. *Am J Obstet Gynecol* 1976;125:754-8.
20. Levin AA, Schoenbaum SC, Stubblefield PG. Ectopic pregnancy and prior induced abortion. *Am J Public Health* 1982;72:253-6.
21. Svensson L, Mardh PA, Ahlgren M, et al. Ectopic pregnancy and antibodies to Chlamydia trachomatis. *Fertil Steril* 1987;48:62-6.
22. World Health Organisation. A multinational case control study of ectopic pregnancy. *Clinical pregnancy. Clin Reprod Fertil* 1985;3:131-43.
23. Chow JM, Yonekura L, Richwald GA, et al. The association between Chlamydia trachomatis and ectopic pregnancy. A matched-pair, case-control study. *JAMA* 1990;263:3164-7.
24. Barnhart K, Mennuti MT, Benjamin I, Jacobson S, Goodman D, Coutifaris C. Prompt diagnosis of ectopic pregnancy in an emergency department setting. *Obstet Gynecol* 1994;84:10-5.
25. Hadgu A, Koch G, Westrom L. Analysis of ectopic pregnancy data using marginal and conditional models. *Statist Med* 1997;16:2403-17.
26. Dart RG, Kaplan B, Varaklis K. Predictive value of history and physical examination in patients with suspected ectopic pregnancy. *Ann Emerg Med* 1999;33:283-90.
27. Ankum WM, Mol BW, van der Veen F, Bossuyt PM. Risk factors for ectopic pregnancy: a meta-analysis. *Fertil Steril* 1996;65:1093-9. Comment in *Fertil Steril* 1997;67:791-2.
28. Mol BW, Ankum WM, Bossuyt PM, van der Veen F. Contraception and the risk of ectopic pregnancy: a meta-analysis. *Contraception* 1995;52:337-41.
29. 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. Comment in *Ann Emerg Med* 1999;34:664-7.