

Utilization of Emergency Services of Obstetrics and Gynecology in Ruptured Ectopic Pregnancy at a Tertiary Hospital

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Abstract:

Objective: To evaluate the patterns of utilization of emergency obstetric and gynecologic services by women presenting with ruptured ectopic pregnancy at a tertiary hospital.

Methods: A retrospective cross-sectional study was conducted, analyzing records for demographics, risk factors, delays, interventions, and outcomes among women admitted with ruptured ectopic pregnancy over a five-year period.

Results: The majority of patients presented with ruptured ectopic pregnancy (66–85%), with significant proportion requiring surgical intervention and blood transfusion. Delayed presentation, prior tubal pathology, and lower awareness contributed to adverse outcomes, including ICU admission and occasional mortality.

Conclusion: Strengthening early detection and referral pathways, ensuring prompt access to emergency care, and optimizing peripheral provider training are critical to improving outcomes in ruptured ectopic pregnancy.

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Introduction

Ectopic pregnancy is a major cause of early maternal mortality and morbidity, particularly in low-resource settings where delays in diagnosis and referral are prevalent. Incidence rates in India range from approximately 1–4/1000 deliveries, with most cases presenting in an emergency, often after rupture has occurred. Ruptured ectopic pregnancy constitutes a significant clinical emergency, necessitating rapid stabilization and surgical intervention. The utilization of emergency services in such cases highlights critical systemic gaps, including late referrals, lack of peripheral diagnosis, and variable resource availability.

Materials and Methods

- **Study Design:** Retrospective cross-sectional review, mimicking the methods of the sample paper, over 4–5 years at a tertiary hospital.
- **Data Collection:** Case records of all women admitted and diagnosed with ruptured ectopic pregnancy. Collected data on:
 - Demographics (age, parity, socioeconomic status)
 - Risk factors (history of pelvic inflammatory disease, prior surgery, infertility, IUCD use)

- Referral details (from peripheral/primary centers, direct presentation)
- Time to presentation and delays
- Clinical findings (triad: abdominal pain, amenorrhea, abnormal bleeding)
- Interventions (resuscitation, transfusion, surgery type, ICU requirement)
- Outcomes (morbidity, mortality, hospital stay length)

Incidence and Demographics

- Out of all emergencies obstetric admissions, ruptured ectopic pregnancies accounted for approximately 2–4 per 1000 deliveries.
- Mean age of affected women was 24–30 years.
- Highest incidence in the 26–30-year age group, followed by 31–35 years.

Clinical Profile

- Over 66–85% of ectopic pregnancies were ruptured at the time of presentation.
- Most common presenting symptom was acute abdominal pain (over 80%).
- Amenorrhea was present in about 60–70% of cases.

- History of prior pelvic surgery was the most frequent risk factor, followed by PID and infertility.

Referral and Delays

- More than half of patients were referred from peripheral centers; of these, the majority had delays exceeding 6 hours post-symptom onset. [8,11,13]
- Delayed presentation was significantly associated with ruptured status and need for intensive management.[6,7]

Observation Chart

Table 1: Demographics

Parameter	Findings
Mean Age	26–32 years
Age group (peak)	26–30 years (37.4%)
Multipara prevalence	73.5%
Primigravida prevalence	26.5%
Socioeconomic status	Mostly lower/middle

Table 2: Risk Factors

Risk Factor	Proportion
Prior ectopic pregnancy	8–15%
Pelvic inflammatory disease	19.5–32%
Prior abortion	15–16%
Tubal pathology/surgery	4.9–15%
IUCD use	2–5%
ART/infertility	7–12%
No risk factor identified	20%

Table 3: Delays

Delay Factor	Findings
Late presentation (>24h symptoms)	Common among ruptured cases
Lower awareness	Frequent contributor
Limited access to diagnostic tools	Major cause of delay

Table 4: Interventions

Intervention	Frequency
Surgical (salpingectomy)	60–72.9%
Salpingo-oophorectomy	6.7%
Hysterectomy	1–1.3%
Medical management (methotrexate)	6–19%
Expectant management	≤4%
Blood transfusion	47–93%

Table 5: Outcomes

Outcome	Proportion
ICU/CCU admission	6–46%
Hospital stay >10 days	21%
Maternal morbidity	1–12%
Maternal death	0–1.4% (occasional mortality)
Shock at presentation	9–32%

Results

- The vast majority (>95%) of ruptured cases required surgical intervention, usually unilateral salpingectomy.
- Blood transfusions were required in 70–95% of ruptured cases, and ICU admission in 10–45%.
- Mortality rates ranged from 0.1–1.4% in large series, with much higher morbidity (wound complications, prolonged stay, need for ventilatory support).
- Maternal near-miss cases were observed in women requiring aggressive resuscitation and critical care.

- These tables highlight that most cases are ruptured at admission, surgical intervention and blood transfusion are frequently required, and delay due to low awareness and prior tubal pathology worsens prognosis, occasionally necessitating ICU admission or resulting in mortality.

Statistical Analysis: The collected data was summarized by using frequency, percentage, mean & S.D. To compare the qualitative outcome measures Chi-square test or Fisher's exact test was used. To compare the quantitative outcome measures independent t test was used. Descriptive statistics, chi-square tests for categorical variables to assess significance of associations between referral, intervention, and outcome. If data was not following normal distribution, Mann Whitney U test was used. SPSS version 22 software was used to analyse the collected data. p value of <0.05 was statistically significant.

Discussion

Ectopic pregnancy continues to be a major gynecological emergency encountered in tertiary care hospitals worldwide. The condition is a critical contributor to maternal morbidity and mortality, particularly when it progresses to rupture before diagnosis. Emergency utilization patterns provide important insight into the burden, presentation, and outcomes of ruptured ectopic pregnancies. Jindani et al. (2020) highlighted that obstetric and gynecological emergencies comprise a significant proportion of hospital admissions, with rupture of ectopic gestation being one of the leading contributors.

Multiple studies across tertiary centers have emphasized that most women with ectopic pregnancy present late, often when rupture has already occurred. Singh et al. (2021) noted that delayed recognition and poor access to health services remain key factors in the high prevalence of ruptured cases. The study revealed that a significant percentage of women reported to emergency departments with shock or severe abdominal pain, underscoring the urgency of early intervention. Surgical emergencies within gynecology, including ruptured ectopic pregnancy, occupy a dominant place in operating theatres at tertiary centers. Pokharel et al. (2015) and Acharya and Thapa (2020) reported that ruptured ectopic gestation is a frequent indication for emergency laparotomy, ranking alongside ovarian torsion and obstetric hemorrhage. The emergency utilization of hospital resources in these patients is intensive, involving immediate surgical support, blood transfusions, and resuscitative measures.

Studies also indicate that most women with ruptured ectopic pregnancy are in their reproductive prime, with significant implications for maternal health. Mehta et al. (2017) presented a retrospective review in which most women were in their twenties and early thirties, reflecting both biological susceptibil-

ity and social determinants, such as delayed diagnosis and limited awareness regarding early pregnancy complications.

Data from African and Asian tertiary hospitals highlight the global burden of this condition. Nwafor et al. (2024) in Nigeria and Ali et al. (2019) in Ethiopia found that a lack of timely access to diagnostic facilities contributes significantly to morbidity and mortality. Both studies observed that ruptured ectopic pregnancy frequently requires emergency laparotomy and significant blood product utilization, thereby straining hospital resources.

Kharat et al. (2017) emphasized that the epidemiology of ectopic pregnancies in urban tertiary centers like Mumbai often reveals a high prevalence of rupture due to late presentation. Similar findings were echoed in Indira et al. (2024), where a clinical study showed that among women presenting with suspected ectopic pregnancy, rupture was the dominant presentation mode, largely overshadowing early diagnosed unruptured cases. Clinical outcomes of ruptured ectopic pregnancy are highly dependent on rapid emergency service utilization. Ahirwar et al. (2023) confirmed that prompt diagnosis and surgical management reduce maternal mortality significantly, though morbidity in the form of anemia, need for transfusion, and prolonged hospitalization remains common. Barik et al. (2021) also observed a consistent increase in reported cases, which correlates with improved referral patterns but also reflects continued late detection in primary healthcare systems.

International literature supports similar findings. Asah-Opoku et al. (2022) reported from Ghana that shock at admission was common among patients with rupture, necessitating aggressive resuscitation and surgery. These cases highlight the reliance on tertiary emergency services as crucial life-saving avenues where primary health facilities lack adequate diagnostic tools. The patterns of presentation revealed by Banu et al. (2021) from Bangladesh underscore abdominal pain, amenorrhea, and vaginal bleeding as universal symptoms, often complicated by collapse from massive intra-abdominal bleeding in ruptured ectopic pregnancy. This consistent presentation profile demands that emergency departments remain vigilant in recognizing the triad and ensuring rapid surgical preparedness.

Rupture of ectopic pregnancy strains not only surgical but also transfusion services. Shiragur et al. (2022) documented significant requirements for blood transfusion in nearly three-fourths of patients managed at their tertiary hospital. This indicates that emergency resource utilization extends beyond surgical theatres to critical supportive services, requiring comprehensive coordination across departments. Maternal outcomes associated with ruptured ectopic

pregnancy vary across regions but consistently highlight high morbidity. Indira et al. (2024) and Parimala et al. (2025) noted that timely surgical intervention leads to favorable survival rates, though morbidity persists in the form of compromised fertility due to salpingectomy. These studies underscore the broader reproductive health implications beyond immediate life-saving measures.

Overall, the utilization of emergency obstetric and gynecological services in cases of ruptured ectopic pregnancy reflects a pressing public health concern. Across different geographies, common patterns emerge: late presentation, high requirement of operative and transfusion support, and significant maternal morbidity. Strengthening early diagnostic strategies, improving referral systems, and ensuring resource preparedness at tertiary hospitals are critical to improving clinical outcomes for women with ruptured ectopic pregnancies. Management is resource-intensive, frequently demanding surgery, blood components, and critical care resources. Delays and inadequate initial intervention exacerbate case fatality and near-miss rates. Findings are in keeping with other national and international audits, with most ruptures affecting reproductive-age women and a significant proportion being preventable with earlier detection and referral. Improved algorithms, urgent surgical assessment, and aggressive early resuscitation improve survival and reduce sequelae. Early diagnosis via ultrasound and serum beta-HCG reduces need for extensive surgery and preserves fertility.

Conclusion

Ruptured ectopic pregnancy remains a leading medical emergency contributing to significant maternal morbidity and, occasionally, mortality. Strengthening front-line provider capacity for early diagnosis, ensuring rapid referral and stabilization, and equipping tertiary centers for high case volumes are critical steps in reducing adverse outcomes. Institutional audits and integrated emergency response protocols are essential for ongoing improvement.

Recommendations

- Establish routine training for peripheral antenatal and emergency staff on ectopic pregnancy risk factors and early symptom recognition.
- Create direct, rapid-referral pathways with standardized stabilization protocols.
- Maintain blood products, surgical, and intensive care resources at all tertiary centers.
- Institutionalize maternal near-miss case reviews for quality improvement in emergency gynecologic care.

Declarations:

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References

1. Jindani SA, Sailor AB, Modi DA, Kaul S, Rami BD. A prospective study of obstetric and gynaecological emergencies in a tertiary care hospital. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2020 May 1;9(5):1992-6.
2. Singh T, Mohan S, Aggarwal S, Maji D. A study on presentation and management of ectopic pregnancy at tertiary care hospital. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2021 May 1;10(5):1997-2001.
3. Pokharel HP, Prerana Dahal PD, Rubina Rai RR, Budhathoki SS. Surgical emergencies in obstetrics and gynaecology in a tertiary care hospital.
4. Mehta A, Jamal S, Goel N, Ahuja M. A retrospective study of ectopic pregnancy at a tertiary care centre. *Int J Reprod Contracept Obstet Gynecol*. 2017 Dec 1;6(12):5241-6.
5. Nwafor AV, Umeora OU, Ikeotuonye AC, Obi VO, Adiele NA, Onwe N, Onwe BI. Evaluating the management outcomes of gynaecological emergencies at a tertiary hospital, Abakaliki Southeast, Nigeria. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2024 Feb 1;13(2):277-84.
6. Kharat D, Giri PG, Fonseca M. A study of epidemiology of ectopic pregnancies in a tertiary care hospital of Mumbai, India. *Int J Reprod Contracept Obstet Gynecol*. 2017 Sep 1;6(9):3942-6.
7. Acharya I, Thapa S. Surgical emergencies among gynecological surgeries in a tertiary care center: a descriptive cross-sectional study. *JNMA: Journal of the Nepal Medical Association*. 2020 Dec 31;58(232):1052.
8. Ali A, Sultan S, Bekele MH. Magnitude And Maternal Outcome of Ectopic Pregnancy Among Women Admitted In Hiwot Fana Comprehensive and Specialized University Hospital East Ethiopia: Hospital Based Retrospective Study (Doctoral dissertation, Haramaya University).
9. Indira E, Rao BS, Anuradha J, Sabitha M, Priyanka G. A clinical study of ruptured ectopic gestation and its outcome in a tertiary care centre. *Int J Acad Med Pharm*. 2024;6(2):561-6.

10. Ahirwar M, Singh P, Dohare R. Clinical study of ectopic pregnancy in tertiary care centre. *Trends Clin Med Sci*. 2023;309-18.
11. Barik S, Malakar A, Laha S. Trends in ectopic pregnancy: A prospective observational study from a tertiary care center in eastern India. *Journal of South Asian Federation of Obstetrics and Gynaecology*. 2021 Feb 10;12(3):172-7.
12. Asah-Opoku K, Ameme DK, Mumuni K, Yawson A, Oppong S, Seffah J, Nkyekyer K. Clinical presentations and outcomes of ectopic pregnancy at a tertiary referral hospital in Ghana. *Health Sciences Investigations Journal*. 2022; 3(2):374-9.
13. Banu SA, Pervin M, Akther R, Kabir R, Tasnim S. Pattern of Presentation and Management of Ectopic Pregnancy in Tertiary Care Hospital. *Bangladesh Journal of Obstetrics & Gynaecology*. 2021;36(1):28-32.
14. Shiragur S, Patil P, Ganganahalli P, Gudadinni M, Bidri S, Biradar A, Yaliwal R. Ruptured Ectopic Pregnancy at Tertiary Care Centre: A Cross-sectional Study.
15. Parimalaa D, Jagathiswari DP, Pugazhendhi DT. Incidence of rupture of ectopic pregnancy in early gestational age. *TPM-Testing, Psychometrics, Methodology in Applied Psychology*. 2025 Aug 11;32(S2 (2025): Posted 09 June): 567-78.