ISSN: 2581 – 3633

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at: https://www.ijmacr.com

Volume – 9, Issue – 6, November – 2026, Page No.: 358 – 365

A Study of Fetomaternal Outcomes in Cases with Premature Rupture of Membranes at a Tertiary Care Center

[1]Dr. Jigar R. Parmar, Senior Resident, Department of Obstetrics and Gynaecology, GCS Medical College, Hospital and Research Centre, Ahmedabad

[2]Dr. Jaishree S. Bamaniya, Professor, Department of Obstetrics and Gynaecology, GCS Medical College, Hospital and Research Centre, Ahmedabad

[3]Dr. Bhumi B. Zalawadiya, Consultant Gyaecologist, Department of Obstetrics and Gynaecology, GCS Medical College, Hospital and Research Centre, Ahmedabad

[4]Dr. Prutha A. Lakum, 3rd year Resident, Department of Obstetrics and Gynaecology, GCS Medical College, Hospital and Research Centre, Ahmedabad

Corresponding Author: Dr. Prutha A. Lakum, 3rd year Resident, Department of Obstetrics and Gynaecology, GCS Medical College, Hospital and Research Centre, Ahmedabad

How to citation this article: Dr. Jigar R. Parmar, Dr. Jaishree S. Bamaniya, Dr. Bhumi B. Zalawadiya, Dr. Prutha A. Lakum, "A Study of Fetomaternal Outcomes in Cases With Premature Rupture of Membranes at a Tertiary Care Center", IJMACR– November – 2026, Volume – 9, Issue – 6, P. No. 358 – 365.

Open Access Article: © 2026, Dr. Prutha A. Lakum, et al. This is an open access journal and article distributed under the terms of the creative common's attribution license (http://creativecommons.org/licenses/by/4.0). Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Premature rupture of membranes (PROM) is defined as rupture of fetal membranes before the onset of labor and is a common clinical event that has significant impact on fetomaternal outcomes. It complicates 5-10% of pregnancies and is a leading cause of preterm birth, perinatal morbidity and neonatal intensive care unit (NICU) admissions. Early identification of risk factors and timely management is crucial to improve outcomes.

Aim and Objectives: To study the fetomaternal outcomes in cases with premature rupture of the membrane and its impact on maternal and fetal outcome.

Methods: This was a prospective observational study conducted in department of obstetrics and gynaecology at a tertiary care center in Ahmedabad, Gujarat, India from July,2023 to june,2024. A total of 149 pregnant women with confirmed PROM with gestational age >28 weeks, who met the stated elibility criteria were included. Detailed history, clinical examination, and investigations were recorded. Patients were divided into term PROM (≥37 weeks) and preterm PROM (28- 36.6 weeks) groups. Maternal outcomes including latency period (rupture to delivery interval), mode of delivery, chorioamnionitis, HVS cultures, wound infections, postpartum fever and fetal outcomes including birth

weight, Apgar score, respiratory distress syndrome, neonatal sepsis, NICU admission, and perinatal mortality were studied.

Results: Majority of patients were in the age group 21-30 years (71.1%). Primigravida constituted 55% of cases. The incidence of preterm PROM was 18.1% and term PROM was 81.9%. Vaginal delivery occurred in 66.4% and cesarean section in 33.6% cases. Anemia (62%) and lower genital tract infection (26.67%) were the most common associated risk factors. The mean latency period was significantly longer in preterm PROM. 83.9% deliveries occurred within 6 hours of PROM. No maternal complications were recorded in 87.2% women. Wound infection was observed in 9%, postpartum fever in 4%, puerperal sepsis in 2% and peritonitis in 0.7% cases. HVS culture growth was reported in 12.1% women. Group B Streptococcus was isolated in 4.7%, Escherichia coli in 4.0%, Klebsiella species in 2.0%, Enterococcus faecalis in 0.7% and Proteus mirabilis in 0.7%. Low birth weight (<2.5 kg) was seen in 52.5% neonates. NICU admission was required in 24.8%% neonates, significantly higher in preterm than term PROM group (37% vs 22.1%). Respiratory distress syndrome (8.1%), neonatal sepsis (5.4%), and hyperbilirubinemia (10.1%) were common neonatal complications.

Conclusion: PROM is associated with significant maternal and neonatal morbidity, especially when it occurs preterm. Lower genital tract infection and anemia are modifiable risk factors. Early diagnosis, prompt treatment of infections, administration of prophylactic antibiotics and antenatal corticosteroids in preterm cases, close surveillance for infection, and timely delivery with good neonatal care can improve fetomaternal outcomes in PROM.

Keywords: amniotic fluid. chorioamnionitis, feto-maternal outcome, premature rupture of membranes, preterm birth, neonatal sepsis

Introduction

Premature rupture of membranes (PROM) is defined as rupture of the fetal membranes before the onset of labor. When it occurs before 37 completed weeks of gestation, it is termed preterm premature rupture of membranes (PPROM). PROM complicates approximately 5-10% of all pregnancies and is a significant cause of maternal and perinatal morbidity and mortality.[1] The etiology of PROM is multifactorial. Risk factors include lower genital tract infections, urinary tract infections, polyhydramnios, multiple pregnancy, malpresentation, cervical incompetence, previous history of PROM, and nutritional deficiencies such as anemia and vitamin C deficiency. Infection and inflammation of the fetal membranes lead to weakening and premature rupture through release of proteolytic enzymes and prostaglandins.[2] PROM is associated with significant maternal complications including chorioamnionitis, postpartum fever, endometritis, increased rate of cesarean section due to fetal distress and failed induction, wound infection, and prolonged hospital stay. The most critical fetal complications are prematurity, low birth weight, respiratory distress syndrome (RDS), neonatal sepsis, cord prolapse, birth asphyxia, and increased need for neonatal intensive care unit (NICU) admission. The latency period, defined as time from rupture of membranes to delivery, is a crucial determinant of outcome.[3] Despite its frequency, there is paucity of recent data on fetomaternal outcomes of PROM from tertiary care centers in Gujarat region. Early identification of risk factors, prompt diagnosis, prophylactic antibiotics, corticosteroids for fetal lung

©2026, IJMACR

maturity in preterm cases, and timely delivery can improve outcomes. Therefore, this study was undertaken to evaluate the fetomaternal outcomes in cases with PROM at a tertiary care center in Ahmedabad.

Aim and Objectives

- To study the fetomaternal outcomes in cases with premature rupture of the membrane and its impact on maternal and fetal outcome.

Materials and Methods

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology, GCS Medical College, Hospital and Research Centre, Ahmedabad, Gujarat, India over a period of 12 months from July 2023 to June 2024 after obtaining approval from the Institutional Ethics Committee.

Sample size: A total of 149 patients with confirmed PROM were included by consecutive sampling.

Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
Pregnant women with gestational age >28 weeks with complaint of leaking per vagina	Gestational age <28 weeks
PROM confirmed by speculum examination (pooling of liquor), positive nitrazine test and ferning	Multiple pregnancy
Singleton pregnancy	fetal congenital anomalies
Willing to give informed consent and follow up	Antepartum hemorrhage or other obstetric complications like preeclampsia, gestational diabetes with complications
	Meconium stained liquor at admission

Data collection: After taking written informed consent in vernacular language, detailed history including age, parity, gestational age, socioeconomic status, history of coitus, previous history of PROM, preterm delivery, genital tract infection, urinary tract infection, smoking, and nutritional status was taken. General, systemic and obstetric examination was done. Per speculum examination was done to confirm PROM and to rule out cord prolapse and to take high vaginal swab. Per vaginal examination was avoided unless patient was in active labor to reduce risk of infection. All patients were investigated with complete blood count, urine routine and culture, high vaginal swab for culture and sensitivity, C-reactive protein (CRP), ultrasonography for fetal well-being, amniotic fluid index (AFI), and estimated fetal weight. Amniotic fluid index was measured by four-quadrant technique and cervical assessment was done using Bishop score as per standard protocol. [4,5]

Management: All patients were hospitalized. Prophylactic antibiotics (injection ampicillin and gentamicin or oral erythromycin as per hospital protocol) were given. In preterm PROM cases <34 weeks, injectable betamethasone 12 mg intramuscular 24 hours apart (2 doses) was given for fetal lung maturity and tocolytics were given if indicated to allow steroid coverage. Patients were monitored for signs of chorioamnionitis (maternal fever >100.4°F, maternal tachycardia >100/min, fetal tachycardia >160/min, uterine tenderness, foul-smelling vaginal discharge, leukocytosis).[6,7] Patients were divided into two groups: Group A - Term PROM (≥37 weeks) and Group B -

©2026, IJMACR

Preterm PROM (28 to 36 weeks 6 days). Mode of delivery was decided based on gestational age, Bishop score, fetal condition and

maternal condition. Cervical assessment was done using Bishop score and amniotic fluid index was measured by four-quadrant technique as per standard protocol. Induction was done with PGE2 gel or oxytocin as indicated.

Maternal outcomes noted were latency period (time from PROM to delivery), chorioamnionitis, postpartum fever, endometritis, mode of delivery, wound infection, and duration of hospital stay. Neonatal outcomes noted were birth weight, Apgar score at 1 and 5 minutes, respiratory distress syndrome, neonatal sepsis, hyperbilirubinemia, NICU admission, and perinatal mortality.

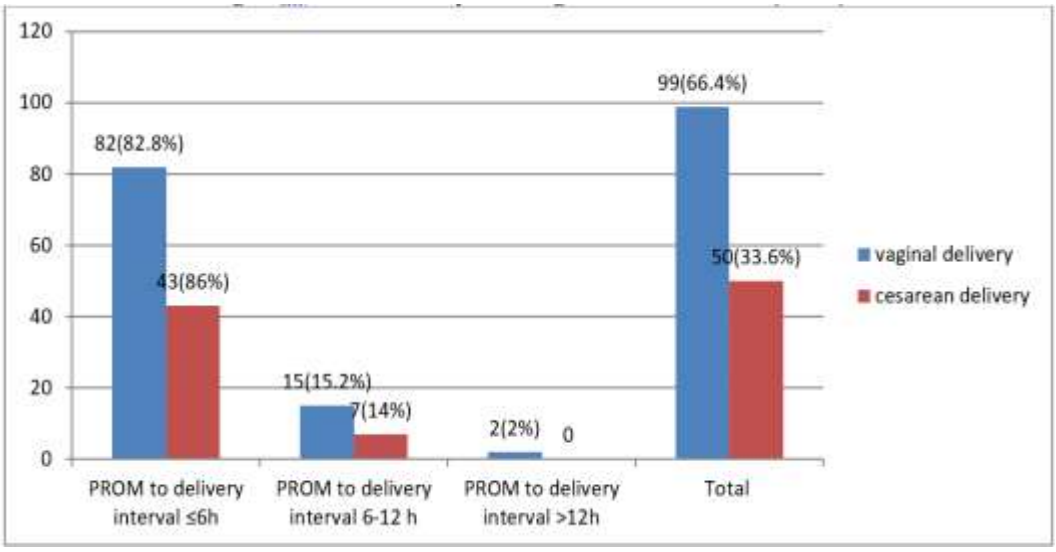
Statistical analysis was done using SPSS version 26.0. Categorical variables were expressed as frequency (n) and percentage (%), continuous variables as mean ± standard deviation. Chi-square test and t-test were used to compare groups. For each chi-square test, test statistics are reported as χ^2 (degrees of freedom, N=149) =value, p-value, and effect size (Cramer's V). P value <0.05 was considered statistically significant.

Result

Table 1: Demographic Profile (N=149)

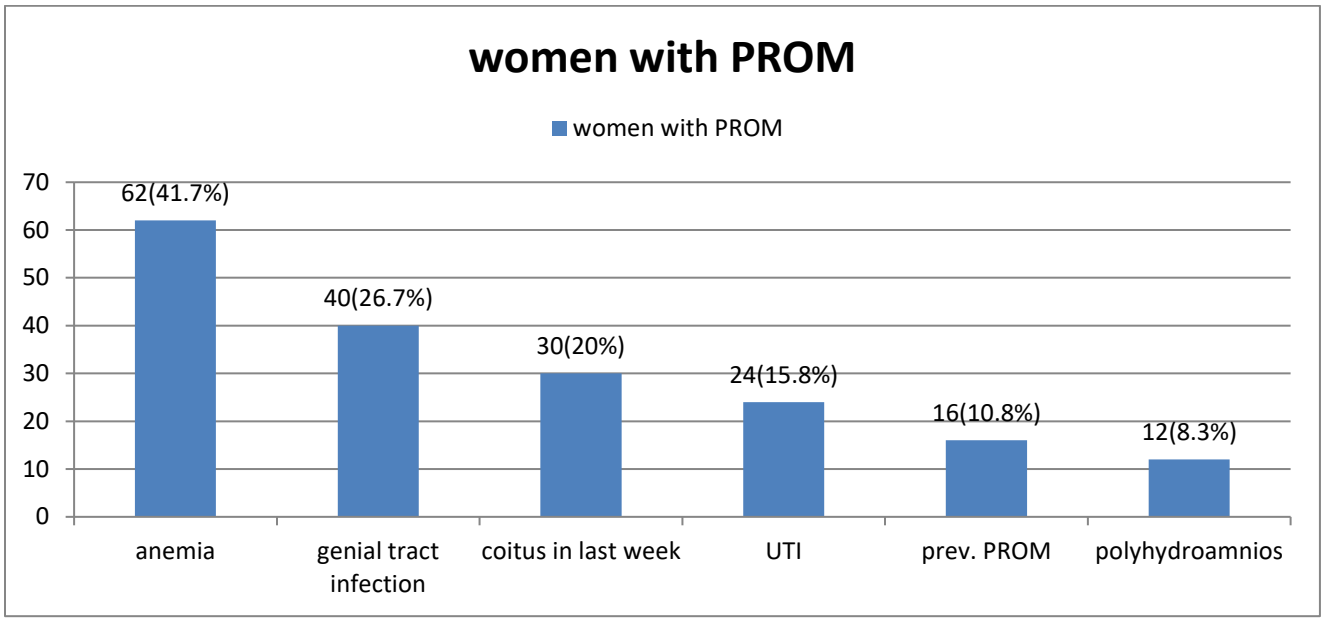
Characteristic	Number of women(N=149)	Percentage (%)
Age 21–30 years	106	71.1%
Age 31–40 years	37	24.8%
Age ≤20 years	5	3.4%
Age >40 years	1	0.7%
Primigravida	82	55.0%
Multigravida	67	45.0%
Preterm PROM (<37 weeks)	27	18.1%
Term PROM (≥37 weeks)	122	81.9%

Figure 1: Mode of delivery according to duration of PROM(N=149)



©2026, IJMACR

Figure 2: Associated risk factors in PROM cases (N=149)



(Patients may have more than one risk factors. UTI =urinary tract infections)

Table 2: Maternal complications (N=149)

Maternal complications	No. Of women
No maternal complication	130(87.2%)
Wound infection	9(6%)
Fever	6(4%)
Puerperal sepsis	3(2%)
Peritonitis	1(0.7%)
Total (N)	149

Table 3: Distribution of the organisms isolated on high vaginal swab (HSV) culture (N=149)

Organism isolated	No. Of cases
Group B Streptococcus	7(4.7%)
Escherichia coli	6(4%)
Klebsiella species	3(2%)
Enterococcus faecalis	1(0.7%)
Proteus mirabilis	1(0.7%)
Total HSV culture positive	18(12.1%)

Table 4: Neonatal complications (N=149)

Outcome	No.of cases
Healthy neonates	107(71.8%)
Jaundice	15(10.1%)

©2026, IJMACR

Respiratory distress syndrome	12(8.1%)
Neonatal sepsis	8(5.4%)
Preterm status	6(4%)
Birth asphyxia	1(0.7%)
NICU admission	37(24.8%)

Table 5: Maternal and neonatal outcomes according to gestational weeks (N=149)

Morbidity Factor		Gestational Weeks <37 (n=27)	Gestational Weeks ≥37(n=122)	p Value
Maternal	Raised TLC	11 (40.7%)	51(41.8%)	0.919
	Maternal Complications	7(25.9%)	12(9.8%)	0.023
	LSCS	10(37%)	40(32.8%)	0.672
Neonatal	Neonatal Complications	11(40.7%)	31(25.4%)	0.109
	NICU Admission	10(37%)	27(22.1%)	0.105
Total		27	122	

In the present study, among 149 cases of PROM, majority belonged to 21-30 years age group 106 (71.1%). Primigravida were 82 (55.0%). Term PROM (≥37 weeks) was seen in 122 (81.9%) and preterm PROM (<37 weeks) in 27 (18.1%). Majority 125 (83.9%) delivered within 6 hours of PROM. Vaginal delivery occurred in 99 (66.4%) and caesarean in 50 (33.6%).

Maternal complications: 130 (87.2%) had no complications. Wound infection 9 (6.0%), fever 6 (4.0%), puerperal sepsis 3 (2.0%) and peritonitis 1 (0.7%). High vaginal swab culture was positive in 18 (12.1%). Most common organism was Group B Streptococcus 7 (4.7%), followed by E. coli 6 (4.0%), Klebsiella 3 (2.0%), Enterococcus faecalis 1 (0.7%) and Proteus mirabilis 1 (0.7%).

Common neonatal complications were jaundice 15 (10.1%), respiratory distress 12 (8.1%) and neonatal sepsis 8 (5.4%).

Microbial growth was significant predictor of unfavorable maternal outcome χ^2 (1, N=149) = 10.83, p=0.001, Cramer's V=0.27. Low birth weight (<2.5 kg) was significant predictor of unfavorable neonatal outcome χ^2 (1, N=149) = 5.81, p=0.016, Cramer's V=0.20.

Discussion

In our study of 149 PROM cases, majority were in age group 21-30 years (71.1%), reflecting early marriage and childbearing in our population. Primigravida predominance (55.0%) was observed, comparable to previous study (56%) and may be attributed to higher incidence of genital tract infection and less awareness. [8,9] We observed term PROM in 81.9% (n=122) and preterm PROM in 18.1% (n=27), which is consistent with previous study who reported 68% term and 32% preterm PROM.[10] Anemia (41.6%) was the most common associated risk factor in our study, followed by lower genital tract infection. This highlights the importance of

©2026, IJMACR

nutritional correction and screening for infections during antenatal period.

Latency period was significantly longer in preterm PROM, similar to previous study.[11] Longer latency in preterm PROM is expected due to conservative management to allow corticosteroid effect and to achieve fetal maturity, but it increases risk of chorioamnionitis. Most women (87.2%) had no maternal complication recorded. HVS culture growth was reported in 12.1% of participants, with Group B Streptococcus and Escherichia coli the most frequently listed isolates. The thesis reports an association between HVS culture growth and unfavourable maternal outcome (p=0.001; OR 0.129, 95% CI 0.039–0.427).

Maternal complications were significantly higher in preterm PROM (25.9% vs 9.8% in term, (p=0.023) in our study. Postpartum complications including wound infection (6.0%) and puerperal sepsis (2.0%) underline need for prophylactic antibiotics. Cesarean section rate was 33.6% in our study. Neonatal complications were higher in preterm PROM group (40.7% vs 25.4%) and NICU admission was 37.0% in preterm vs 22.1% in term PROM comparable to previous studies. NICU admission rate of 24.8% is similar to 40-50% reported by other authors in preterm groups.[12]

Limitations

The limitations identified in the study include the single-centre design, a sample size of 149 with potentially limited power for subgroup analyses, short-term neonatal follow-up, reliance on HVS rather than amniotic-fluid or placental cultures, possible information bias from records and patient interviews, and absence of a non-PROM comparison group. Additional reporting limitations evident in the study are inconsistent terminology for study design, incomplete description of statistical methods and outcome coding, and a discrepancy between the reported PROM-to-delivery interval distribution and mean delivery intervals.

Conclusions

Premature rupture of membranes is a common obstetric complication with significant fetomaternal morbidity, especially when it occurs preterm. Anemia and lower genital tract infection are the most common modifiable risk factors and should be screened and treated during antenatal period. Term PROM has relatively better maternal and perinatal outcomes compared to preterm PROM. Preterm PROM is associated with longer latency, increased risk of chorioamnionitis, longer hospital stay, higher rate of low birth weight, respiratory distress syndrome, neonatal sepsis and NICU admission. Management of PROM requires early diagnosis by speculum examination, avoidance of unnecessary digital vaginal examinations, prompt administration of prophylactic antibiotics and antenatal corticosteroids in preterm cases (<34 weeks), close monitoring for signs of infection, timely induction/delivery and good neonatal support. Regular antenatal care, health education regarding personal hygiene, treatment of genitourinary infections and correction of anemia can reduce incidence of PROM and improve outcomes. Multidisciplinary approach involving obstetrician and neonatologist is essential for optimizing fetomaternal outcomes in PROM.

References

1. Singh N, Pattnaik L, Panda SR, Jena P, Panda J. Fetomaternal outcomes in women affected with preterm premature rupture of membranes: an observational study from a tertiary care center in Eastern India. 2022;14:25533.

©2026, IJMACR

2. Garg A, Jaiswal A. Evaluation and management of premature rupture of membranes: a review article. 2023;15:36615.
3. Thomas A, Anoop A, Anbarasan B, Nair GG. Influence of preterm premature rupture of membranes on maternal and fetal outcomes in pregnancy. 2024;16:65123.
4. Hameed GS, Shirgur S, Patil M, et al. Comparison of seven-day versus continuous prophylactic antibiotic therapy until delivery in preterm premature rupture of membranes. 2025;17:83991.
5. Neonatal outcome after expectant management of preterm premature rupture of membranes between 34+0 and 36+6 weeks of gestation: a single-center cohort study. 2025;17:92985.
6. Mondal A, Kanungo S. A study on fetomaternal outcome in premature rupture of membranes. Int J Reprod Contracept Obstet Gynecol. 2018;7:897-902.
7. Endale T, Fentahun N, Gemada D, Hussen MA. Maternal and fetal outcomes in term premature rupture of membrane. World J Emerg Med. 2016;7:147-152.
8. Rana M, Patra S, Puri M, Trivedi SS. Fetomaternal outcome in preterm premature rupture of membrane. Int J Infertil Fetal Med. 2014;5:18-21.
9. Tsakiridis I, Mamopoulos A, Chalkia-Prapa EM, Athanasiadis A, Dagklis T. Preterm premature rupture of membranes: a review of 3 national guidelines. Obstet Gynecol Surv. 2018;73:368-375.
10. Khan SA, Imran F, Khan JA. Review of feto-maternal outcome in patients with premature rupture of membranes at term. J Saidu Med Coll Swat. 2024;14:105-108.
11. Abebe T, Nima D, Mariye Y, Leminie A. The magnitude of maternal and neonatal adverse outcomes associated with preterm premature rupture of membrane: a prospective cohort study. J Neonatal Nurs. 2024;30:342-348.
12. Zhuang L, Li ZK, Zhu YF, et al. Latency period of PROM at term and the risk of neonatal infectious diseases. Sci Rep. 2022;12:11822.

©2026, IJMACR