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Original Research Article

Analysis of Feto-Maternal Outcome in Premature Rupture of Membranes at Term Pregnancy in a Tertiary Care Hospital: An Observational Study

Annu Shree [1], Sadia Farooque[2], Archana Bharti[3], Puja Mahaseth[4]

[1]Senior Resident, Department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar.

[3]Senior Resident, Department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar.

[3]Associate Professor, Department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar.

[4]Associate Professor and HOD, Department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar.

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Corresponding author: Dr. Sadia Farooque

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Abstract

Background: Premature rupture of membranes is such a condition in which there is a high risk of maternal and perinatal adverse outcomes. Premature rupture of membranes has an incidence of 5-10%. About 60% of cases of PROM occur at term. Aim of this study is to assess feto-maternal outcomes following PROM in term pregnancy and the role of the duration of membrane rupture in the development of complications.

Methods: The Department of Obstetrics and Gynecology at Darbhanga Medical College and Hospital in Laheriasarai, Bihar, conducted this hospital-based observational study from March 2025 to February 2026. Total 75 cases of rupture of membranes spontaneously after 37 completed weeks who admitted in obstetrics and gynaecology department were included in this study. All the Data were analyzed using SPSS version 26.

Results: History of term PROM was seen in 15% of the patients, History of abortion was seen in 12% of the patients and history of preterm PROM was observed in 7% of patients. When risk factors and PROM were compared, anaemia was 20%, UTI was 10%, lower genital infections were 8%, cervical stich was 2%, mal presentations were 4%, hydramnias were 4% and there were no risk factors in 27% of the patients. Favourable bishop score was observed 30 patients undergoing vaginal delivery, 10 in LSCS, and unfavourable bishop score was observed in 20 patients undergoing vaginal delivery, 9 in LSCS. Number of cases in maternal morbidity was highest in > 24 hours i.e. 26.7%, perinatal morbidity cases were highest in 12-24 hours i.e. 30% and mortality among perinatal cases were 5% in 12-24 hours and >24 hours of PROM.

Conclusion: PROM is associated with poor fetomaternal outcome which can be prevented by early diagnosis and prompt management.

Keywords: PROM, Feto-maternal, Pregnancy, Neonatal.

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Introduction

The spontaneous rupture of fetal membranes before to the start of labor at any gestational age is known as preterm rupture of membranes (PROM). About 8–10% of pregnancies are complicated by term PROM if it occurs at term (≥37 weeks) [1]. It is one of the most urgent issues in obstetrics and may be linked to a higher risk of morbidity for both mothers and newborns. About 60–70% of term pregnancies are likely to go into spontaneous labor within 24 hours after PROM [2]. On the other hand, the remaining ones may experience prolonged latency, raising concerns about ascending infections and their associated consequences. Mechanical stress, biochemical processes involving collagenolytic enzymes, inflammatory mediators, and potentially subclinical infection are all part of the complicated pathophysiology of PROM [3]. When combined, these factors weaken the amniotic membrane and increase the risk of rupture. Previous PROM, vaginal tract infections, placental problems, numerous pregnancies, and low socioeconomic status are risk factors for PROM [4]. Genitourinary infections are the most significant of these because they can spread throughout the genital tract, trigger inflammatory reactions, and compromise the

integrity of the membrane through a variety of cytokines and proteolytic enzymes [5]. Fetal and maternal outcomes have often been proven to be significantly influenced by the latency period between membrane rupture and delivery. The incidence of complications such as chorioamnionitis, puerperal sepsis, and newborn infection increases noticeably as the duration increases, particularly above 12 hours [6]. About 9% of term PROM cases had chorioamnionitis, which can cause uterine discomfort, tachycardia, and fever in the mother [7].

In around 2-4% of compromised infants, prolonged PROM increases the risk of neonatal infection, respiratory distress, and prolonged hospitalization [8]. In order to prevent potential infection complications, aggressive care of the term PROM has evolved throughout the years to include labor induction within an acceptable time after membrane rupture [9].

The question of when, however, is controversial and involves balancing the danger of complications after intervention with the risk of expectant management. Among the factors influencing decision-making in this case are gestational age, the existence or absence of maternal fever, the state of the fetus, and the accessibility of medical facilities [10]. It is impossible to overstate the need of thorough clinical examination and timely action, particularly in situations with limited resources where continuous electronic fetal monitoring may not be readily available.

PROM management and outcome are influenced by the pregnant woman's socioeconomic situation and ANC status. Risk factors can be identified early and predisposing conditions can be treated early under routine ANC [11]. Membrane strength and subsequent risk of PROM have also been associated with maternal nutrition, particularly micronutrient status [12].

This study aims to evaluate feto-maternal outcomes following PROM in term pregnancies, particularly the length of membrane rupture and the emergence of complications.

We intend to identify the crucial times for intervention and assess the impact of postponed treatment on maternal and newborn morbidity by classifying cases into latency periods (<12 hours or ≥12 hours). The goal of this research is to create evidence-based recommendations for the treatment of term PROM in tertiary care, which may reduce unfavorable outcomes through prompt and suitable interventions.

Material and Methods

The Department of Obstetrics and Gynecology at Darbhanga Medical College and Hospital in Laheriasarai, Bihar, conducted this hospital-based observational study from March 2025 to February 2026. Total 75 cases of rupture of membranes spontaneously after 37 completed weeks who admitted in obstetrics and gynaecology department, DMCH, Laheriasarai, Bihar were included in this study.

Patients who had gestational age of more than 37 weeks confirmed clinical examination or ultrasound, cervical dilatation of less than 3 cm, lack of uterine contractions for at least 1 hour from PROM, single live pregnancy in vertex presentation, PROM confirmed by direct visualisation or by litmus test were included in this study.

Patients who had gestational age of less than 37 weeks, cervical dilatation of more than 3 cm, women in labour or with uterine contractions within 1 hour of rupture of membrane, previous history of caesarean section and mal-presentations and multiple gestations were excluded in this study.

A detailed history was taken from all the patients and patients with prelabour rupture of membranes were admitted for this study. General and Obstetric examination was done. The examination of sterile speculum was done and the presence of amniotic fluid was noted by collecting the fluid on slide and examining under microscope. Amniotic fluid culture and urine culture were done.

All cases were administered with prophylactic IV antibiotics. In all the cases, a 4th hourly record of pulse of mothers, blood pressure and temperature was maintained and delivery was conducted within 24 hours. Foetal distress cases were delivered by emergency caesarean section.

All the Data were analyzed using SPSS version 26.

Results

Total 75 cases of rupture of membranes spontaneously after 37 completed weeks who admitted in obstetrics and gynaecology department, DMCH, Laheriasarai, Bihar were included in this study.

Table 1: Demographic distribution in the study

Demographics	No. of Patients (n=75)	Percentage
Age Distribution		
15-20 years	9	12%
21-25 years	55	73.3%
26-30 years	7	9.3%
31-35 years	3	4%
Morethan35 years	1	1.3%
Parity Distribution		
Primi	58	77.3%
Multi	17	22.7%
Antenatal Care		
Booked	20	26.7%
Unbooked	55	73.3%

The age group of 21 to 25 years old had the highest percentage of PROM, 73.3% (55), according to Table 1. There were 77.3% primigravida, 22.7% multigravida, 20 booked cases, and 73.3% unbooked cases in this study.

Table 2: Previous obstetric and gynaecological history versus PROM

Variable	Percentage
History of term PROM	15%
History of abortion	12%
History of preterm PROM	7%

According to Table 2, 15% of patients had a history of term PROM, 12% had a history of abortion, and 7% had a history of preterm PROM.

Table 3: Risk factors versus PROM

Risk Factor	Percentage
Anaemia	20%
Urinary tract infections (UTI)	10%
Lower genital infection	8%
Cervical Stich	2%
Mal-presentations	4%
Hydramnias	4%
No risk factors	27%

When risk factors and PROM were compared, Table 3 reveals that 20% of patients had anemia, 10% had UTIs, 8% had lower genital infections, 2% had cervical stitches, 4% had mal-presentations, 4% had hydramnias, and 27% had no risk factors.

Table 4: Bishop score and delivery mode in PROM

Bishop score	Vaginal delivery	LSCS	Total
Favourable score	30	10	40
Unfavorable score	20	9	29
Total number of cases	50	19	69

Table 5: Maternal and perinatal morbidity and perinatal mortality versus PROM

Duration of PROM	Total no. of cases	Maternal morbidity cases	Percentage
<12 hours	---	1	1.3%
12-24hours	---	5	6.7%
> 24 hours	---	20	26.7%
Duration of PROM	**Total no. of cases**	**Perinatal morbidity cases**	**Percentage**
<12 hours	10	1	10%
12-24hours	20	6	30%
> 24 hours	40	10	25%
Duration of PROM	**Total no. of cases**	**Perinatal mortality cases**	**Percentage**
<12 hours	10	0	0
12-24hours	20	1	5%
> 24 hours	40	2	5%

Table 4 demonstrates that 30 patients undergoing vaginal delivery, 10 in LSCS, had favorable bishop scores, while 20 patients undergoing vaginal delivery, 9 in LSCS, had unfavorable bishop scores. Table 5 demonstrates that the number of maternal morbidity cases was highest in > 24 hours (26.7%), the number of perinatal morbidity cases was highest in 12-24 hours (30%), and the mortality rate among perinatal cases was 5% in 12-24 hours and >24 hours of PROM.

Discussion

The incidence of premature rupture of membranes at term, risk factors, risk of surgical delivery, effects and complications of premature rupture of membranes at term, and its impact on maternal and neonatal outcomes were all examined in a study by Dr. V. Revathi et al. [13]. Patients with proven premature rupture of membranes at term were enrolled in the prospective research, which tracked labor progress, delivery method, and maternal and neonatal outcomes. Premature rupture of the membranes was more common among women from lower socioeconomic groups, unbooked cases, and those who had previously had abortions. As the length of labor and delivery grew, so did the incidence of maternal morbidity and perinatal morbidity and mortality, as well as the rate of cesarean deliveries. A prospective observational study of 100 patients with preterm premature rupture of membranes between 28 and 37 weeks gestation who were admitted to our tertiary care center was carried out by Shwetha Anant Mohokar et al. [14]. Of the patients in this trial, 55% required induction or augmentation, whereas 45% went into spontaneous labor. Of the patients, 25% needed LSCS and 65% had vaginal births.

Malpresentation (28%) and fetal distress (24%) are the primary indications for LSCS. 16% of patients had morbidity, however there was no maternal mortality. RDS (21%), sepsis (10%), and hyperbilirubinemia (23%) accounted for the majority of the 33% of perinatal morbidity. Sepsis accounted for 27% of perinatal deaths, RDS for 53%, and birth asphyxia for 20%. According to HailemariamSegni et al. [15], 14.6% of membranes ruptured too soon. 42 (1.5%) have a gestational age of fewer than 37 weeks.

For conservative management, the mother who was admitted to maternity stayed for a minimum of four days and a maximum of thirty-three days. Multivariate analysis of the contributing factors for neonatal admission to the intensive care unit reveals that, in comparison to the duration of membrane rupture, delivery before 34 weeks is more likely to result in NICU admission (RR 4, p-0.000). By univariate analysis, PROM > 12 hours (RR 1.8, P-0.011) and monthly income ≤ $1.9 (RR, 0.69, p, 0.108) were contributing factors to an increase in poor postpartum mother outcomes. Multivariate analysis revealed a significant increase in poor maternal outcomes when PROM > 12 hours (RR 1.9, P-0.015) was compared to monthly income ≤ $1.9 (RR, 0.69, p, 0.108). Due to conservative hospital care, the majority of patients with gestational ages under 34 weeks gave birth after 12 hours of PROM. The length of the membrane rupture was substantially correlated with maternal hospital stays (R = 4.9, p-0.028). According to Tigist Endale et al. [16], 202 of the 4,525 women who gave birth in the hospital had PROM. Maternal outcomes were poor for about 22.2% of the mothers. Puerperal sepsis was the leading cause of maternal morbidity and mortality. Unfavorable outcomes affected about 33.5% of newborns. Unfavorable outcomes were linked to PROM length >12 hours (AOR=5.6, 95%CI 1.3–24.1), latency >24 hours (AOR=2.8, 95%CI 1.7–11.8), living in rural regions (AOR=4.2, 95%CI 3.96–29.4), and birth weight <2,500 g. According to Arnab Mondal et al. [17], PROM cases had considerably increased rates of puerperal hemorrhage, LBW newborns, preterm, maternal morbidities, chorioamnionitis, perinatal death, and neonatal morbidities. Most of the time, these data supported the conclusions of other researchers.

Conclusion

According to the study's findings, women with unbooked cases and those with a history of both premature rupture of membranes and abortions had a greater frequency of this condition. As the duration of labor and delivery increased, so did the frequency of maternal morbidity and perinatal morbidity and mortality, which in turn raised the number of cesarean deliveries.

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