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# Perinatal outcomes associated with latency period after preterm premature rupture of membranes before 32 weeks of gestation

**Mustafa Rasit Ozler, Erkan Saglam**

*Bursa City Hospital, Department of Perinatology, Bursa, Türkiye*

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**Abstract**

This study aimed to evaluate the impact of the latency period until delivery on obstetric and perinatal outcomes in pregnancies diagnosed with preterm premature rupture of membranes (PPROM) before 32 weeks' gestation. This retrospective study included 192 singleton pregnancies managed at a tertiary center between January 2020 and January 2025. Patients with multiple gestations, placenta previa, fetal anomalies, hypertensive disorders, gestational diabetes, cervical surgery history, vaginal bleeding at admission, or delivery within 48 h of PPROM were excluded. Patients were classified according to gestational age at PPROM and the latency period. Maternal complications, obstetric outcomes, and neonatal morbidity parameters were compared, and predictors of neonatal complications were assessed using receiver operating characteristic (ROC) analysis. The longest latency occurred in the <24-week group, and the shortest occurred in the 28–31+6-week group. Prolonged latency is associated with higher rates of cesarean delivery, placental abruption, and chorioamnionitis. Birth weight increased significantly with longer latency periods in all subgroups. In the 24–27+6-week group, prolonged latency reduced respiratory distress syndrome and total neonatal complications. In the <24-week group, a shorter latency was associated with a higher incidence of retinopathy. ROC analysis identified gestational age at delivery as the strongest predictor of neonatal complications. In conclusion, gestational age at delivery was the primary determinant of perinatal outcomes in PPROM <32 weeks. Nevertheless, prolongation of latency, especially between 24 and 27+6 weeks, improves neonatal prognosis, although maternal risks increase.

**Keywords:** Premature rupture of fetal membranes, pregnancy outcome, infant, premature

## Introduction

Preterm premature rupture of membranes (PPROM) refers to the spontaneous disruption of the fetal membranes before 37 weeks of gestation. It is responsible for nearly one-third of all preterm deliveries. This condition affects approximately 1–3% of pregnancies and remains an important contributor to both maternal and neonatal morbidity and mortality [1]. On the neonatal side, PPROM predisposes infants to complications related to prematurity, including respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC), sepsis, and death. Maternal complications are also clinically significant, with chorioamnionitis, placental abruption, and cord prolapse frequently observed [2-4]. In addition, women with a previous episode of PPROM are at an elevated risk of recurrence, with reported rates ranging from 13% to 32% [5].

Gestational age is the principal factor influencing therapeutic decisions for PPROM. Pregnancies complicated before 32 weeks present the greatest challenge for obstetricians, as they carry a dual risk of serious neonatal morbidities related to extreme prematurity and maternal–fetal infections. In cases diagnosed between 24 and 33^6/7 weeks, clinicians often adopt an expectant approach, aiming to prolong pregnancy by using antenatal corticosteroids and prophylactic antibiotics [6,7]. However, extending the latency period is not without drawbacks, as it is associated with an increased risk of infection.

The effects of the latency interval following PPROM on obstetric and neonatal outcomes have been widely studied. However, the results in the literature remain contradictory. While some studies have reported that prolonged latency may improve neonatal survival, others have demonstrated that the associated increased risk of infection may adversely affect neonatal prognosis [8].

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**Corresponding Author:** Mustafa Rasit Ozler, Bursa City Hospital, Department of Perinatology, Bursa, Türkiye
Email: m.rasitozler@gmail.com

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Although PPROM is clinically important, it is a heterogeneous and challenging condition, with many uncertainties regarding its underlying mechanisms, diagnostic approach, and optimal management. Clear and individualized counseling for affected women is essential, particularly regarding possible adverse perinatal outcomes and treatment strategies. Estimating both the likely interval between membrane rupture and delivery and the incidence of obstetric or neonatal complications may provide valuable guidance for clinical practice. In this context, the present study focused on pregnancies complicated by PPROM before 32 weeks of gestation, aiming to emphasize the clinical relevance of the latency period and assess its relationship with perinatal outcomes.

## Material and Methods

This retrospective study was conducted at a tertiary referral hospital between January 2020 and January 2025. The institutional ethics committee approved the study protocol (approval date: June 25, 2025; decision number: 2025-13/13). The cohort comprised 192 women with singleton pregnancies complicated by PPROM before 32 weeks of gestation. The exclusion criteria were multiple gestations, placenta previa, major fetal malformations, hypertensive disorders of pregnancy, gestational diabetes, prior cervical surgery, and vaginal bleeding at the time of admission. Additionally, cases delivered within 48 h of PPROM were excluded, as this time was considered insufficient for antenatal corticosteroids to exert their effects. To minimize potential sources of bias, all cases were managed using standardized institutional protocols, and the inclusion and exclusion criteria were strictly applied.

Patients were stratified into three categories according to gestational age at PPROM diagnosis: <24 weeks (n=44), 24–27+6 weeks (n=68), and 28–31+6 weeks (n=80). Latency was defined as the interval from membrane rupture to delivery and was further subdivided into three groups: 3–7 days (n=56), 8–13 days (n=64), and ≥14 days (n=72). The diagnosis of PPROM was confirmed by direct visualization of amniotic fluid pooling in the posterior vaginal fornix during a speculum examination. All women were admitted for inpatient management and received antibiotic prophylaxis (ampicillin 1 g every 12 h or erythromycin 500 mg every 6 h for 7 days), along with a single course of antenatal corticosteroids (betamethasone 12 mg daily for 2 consecutive days). Nifedipine tocolysis was considered in women presenting with uterine contractions and concurrent cervical dilatation (CD). The amniotic fluid index (AFI) was monitored twice weekly in all cases, and for pregnancies beyond 25 weeks, a complete biophysical profile was also performed. When non-reactive fetal heart rate patterns were detected, Doppler studies were performed, particularly in pregnancies at or below 32 weeks' gestation. Delivery was indicated if fetal acidosis was suspected to be present. Oligohydramnios was defined as an AFI <5 cm, whereas anhydramnios referred to cases with unmeasurable amniotic fluid.

Clinical chorioamnionitis was diagnosed when at least two criteria were met, including maternal fever (≥37.8 °C), uterine tenderness, malodorous vaginal discharge, leukocytosis (>18.000/mm³), maternal tachycardia (>100 beats/min), or fetal tachycardia (>180 beats/min). The indications for cesarean delivery included clinical chorioamnionitis, placental abruption, cord prolapse, non-reassuring fetal status, and a history of uterine surgery. Women who neither went into spontaneous labor nor developed an indication for cesarean delivery were managed expectantly until 34 weeks' gestation, after which delivery was advised.

The variables assessed in this study included maternal characteristics (age, body mass index, gravidity, parity, smoking status, and prior history of PPROM), obstetric outcomes (cesarean section rate, clinical chorioamnionitis, oligohydramnios, anhydramnios, cord prolapse, placental abruption, and fetal distress), and neonatal outcomes (birth weight, Apgar score <5 at 1 min, Apgar score <7 at 5 min, and admission to the neonatal intensive care unit [NICU] ). Secondary neonatal morbidities evaluated included RDS, bronchopulmonary dysplasia (BPD), NEC, retinopathy of prematurity (ROP), patent ductus arteriosus (PDA), and neonatal sepsis. The occurrence of one or more of these neonatal complications was collectively categorized as "total neonatal complications."

### Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics version 20. Continuous variables are presented as the mean ± standard deviation, whereas categorical variables are presented as frequencies and percentages. Normality of the data distribution was examined using the Kolmogorov–Smirnov test. For normally distributed variables, one-way analysis of variance (ANOVA) was applied, and the Bonferroni correction was used for post hoc pairwise comparisons. For non-normally distributed variables, the Kruskal–Wallis test was used, followed by the Mann–Whitney U test for two-group comparisons. Associations between categorical variables were assessed using the chi-square test. Receiver operating characteristic (ROC) curve analysis was performed to identify cutoff values predictive of neonatal complications. A p-value<0.05 was accepted as the threshold for statistical significance.

## Results

A total of 192 singleton pregnancies diagnosed with PPROM before 32 weeks of gestation were included in the study. Of these, 44 were diagnosed before 24 weeks, 68 between 24 and 27+6 weeks, and 80 between 28 and 31+6 weeks. No missing data were encountered for the analyzed variables, and all cases were included in the final analyses. Regarding demographic characteristics, no significant differences were found between the groups in terms of maternal age, body mass index, gravidity, parity, smoking status, or history of PPROM (all p>0.05).

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However, significant differences were observed between the groups in terms of gestational age at PPROM, gestational age at delivery, and latency period. The latency period was the longest in the <24-week group (18.4±15.6 days) and the shortest in the 28–31+6-week group (8.7±6.3 days) (p<0.001, Table 1).

No differences were found between the groups in terms of maternal age or body mass index (p>0.05) when classified by latency duration. However, the cesarean section rate increased with increasing latency (3–7 days: 42.9%; ≥14 days: 69.4%; p=0.018). Placental abruption was more frequent in the ≥14-day group (9.7%, p=0.049). The incidence of clinical chorioamnionitis was particularly high in the 8–13-day group (23.4%, p=0.041). No significant difference was observed in cord prolapse (p=0.418, Table 2).

Regarding neonatal outcomes, birth weight increased significantly with longer latency across all gestational subgroups (<24 weeks: 640 g → 890 g; 24–27+6 weeks: 1180 g → 1520 g; 28–31+6 weeks: 1780 g → 2040 g; all p<0.01). In the <24-week group, both the 1st- and 5th-minute Apgar scores improved significantly with longer latency (p=0.020 and p=0.010, respectively). No significant differences in Apgar scores were observed between the 24 and 27+6 weeks and 28–31 +6 weeks groups. The need for neonatal intensive care was high in all groups, with no statistical differences between them (Table 3).

Regarding secondary neonatal outcomes, the <24-week group showed a high rate of RDS, independent of latency duration (87–93%). However, in this group, the incidence of retinopathy was significantly higher with shorter latency (any stage ROP: 42.9%; advanced stage: 14.3%; p=0.031 and p=0.041). In the 24–27+6-week group, longer latency was associated with a significant reduction in RDS (60% → 16%, p=0.004) and a marked decrease in total complication rates (55% → 16%, p=0.018). In the 28–31+6-week group, complication rates were generally low and were not affected by latency duration (Table 4).

ROC analysis identified gestational age at delivery as the strongest predictor of neonatal complications (cut-off: 30.4 weeks; AUC=0.73; 95% CI: 0.65–0.80; p<0.001). The latency period was also a significant predictor, although with lower accuracy (cut-off: 10 days; AUC=0.64, 95% CI: 0.55–0.72, p=0.012; Table 5, Figure 1).

**Table 1.** Demographic and clinical characteristics of women with PPROM according to gestational age at rupture

| Variable | Total (n=192) | <24 weeks (n=44) | 24–27+6 weeks (n=68) | 28–31+6 weeks (n=80) | p-value |
|---|---|---|---|---|---|
| **Maternal age (years)*** | 28.9 ± 6.7 | 29.6 ± 7.1 | 29.4 ± 6.2 | 27.9 ± 6.8 | 0.412[1] |
| **BMI (kg/m²)*** | 27.5 ± 4.3 | 27.8 ± 4.6 | 27.9 ± 4.1 | 27.1 ± 4.2 | 0.633[1] |
| **Gravidity*** | 2.5 ± 1.5 | 2.7 ± 1.6 | 2.6 ± 1.4 | 2.3 ± 1.5 | 0.417[1] |
| **Parity*** | 1.0 ± 1.1 | 1.1 ± 1.0 | 1.0 ± 1.1 | 0.9 ± 1.2 | 0.592[1] |
| **GA at PPROM (weeks)*** | 27.1 ± 3.4 | 23.1 ± 0.7[a] | 25.9 ± 1.0[b] | 29.7 ± 1.0[c] | ***<0.001[1]*** |
| **GA at delivery (weeks)*** | 29.4 ± 3.1 | 25.9 ± 2.4[a] | 29.3 ± 2.0[b] | 31.8 ± 1.3[c] | ***<0.001[1]*** |
| **Latency period (days)*** | 12.7 ± 11.5 | 18.4 ± 15.6[c] | 13.9 ± 10.2[b] | 8.7 ± 6.3[a] | ***<0.001[1]*** |
| **History of PPROM n (%)** | 21 (10.9) | 6 (13.6) | 8 (11.8) | 7 (8.8) | 0.642[2] |
| **Smoking during pregnancy n (%)** | 11 (5.7) | 3 (6.8) | 4 (5.9) | 4 (5.0) | 0.871[2] |

BMI: body mass index, GA: gestational age, PPROM: preterm premature rupture of membranes. Data are presented as mean ± standard deviation or number (%). Statistical significance was set at p<0.05. [1]ANOVA test; [2]Chi-square test. Post-hoc Tukey (ANOVA): c>b>a

**Table 2.** Maternal and obstetric complications according to latency period after PPROM

| Variable | 3–7 days (n=56) | 8–13 days (n=64) | ≥14 days (n=72) | p-value |
|---|---|---|---|---|
| **Maternal age (years)*** | 28.4 ± 6.2 | 29.1 ± 6.9 | 28.7 ± 6.5 | 0.741[1] |
| **BMI (kg/m²)*** | 27.6 ± 4.4 | 27.9 ± 4.1 | 27.4 ± 4.6 | 0.662[1] |
| **C/S rate n (%)** | 24 (42.9)[a] | 35 (54.7)[b] | 50 (69.4)[b] | ***0.018[2]*** |
| **Cord prolapse n (%)** | 3 (5.4) | 2 (3.1) | 1 (1.4) | 0.418[2] |
| **Abruptio placentae n (%)** | 1 (1.8) | 3 (4.7) | 7 (9.7) | ***0.049[2]*** |
| **Clinical chorioamnionitis n (%)** | 4 (7.1) | 15 (23.4) | 12 (16.7) | ***0.041[2]*** |

BMI: body mass index, C/S: cesarean section, PPROM: preterm premature rupture of membranes. Data are presented as mean ± standard deviation or number (%). p<0.05 was considered statistically significant. [1]ANOVA test; [2]Chi-square test. Post-hoc Tukey (ANOVA): c>b>a

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**Table 3.** Primary neonatal outcomes according to latency period and gestational age at PPROM

| Variable | | 3–7 days (n=56) | 8–13 days (n=64) | ≥14 days (n=72) | p-value |
|---|---|---|---|---|---|
| **<24 weeks (n=44)** | **Birth weight (grams)*** | 640 ± 120[a] | 710 ± 140[a] | 890 ± 160[b] | **<0.001[1]** |
| | **Apgar score 1st min <5 n (%)** | 12 (85.7) | 8 (53.3) | 5 (33.3) | **0.020[2]** |
| | **Apgar score 5th min <7 n (%)** | 12 (85.7)[b] | 7 (46.7)[a] | 4 (26.7)[a] | **0.010[2]** |
| | **Admission to NICU n (%)** | 14 (100) | 15 (100) | 14 (93.3) | 0.329[2] |
| **24–27+6 weeks (n=68)** | **Birth weight (grams)*** | 1180 ± 210[a] | 1240 ± 230[b] | 1520 ± 280[c] | **<0.001[1]** |
| | **Apgar score 1st min <5 n (%)** | 5 (25.0) | 4 (17.4) | 2 (8.0) | 0.228[2] |
| | **Apgar score 5th min <7 n (%)** | 4 (20.0) | 3 (13.0) | 1 (4.0) | 0.206[2] |
| | **Admission to NICU n (%)** | 20 (100) | 22 (95.7) | 23 (92.0) | 0.382[2] |
| **28–31+6 weeks (n=80)** | **Birth weight (grams)*** | 1780 ± 260[a] | 1820 ± 250[b] | 2040 ± 300[c] | **0.009[1]** |
| | **Apgar score 1st min <5 n (%)** | 2 (9.1) | 3 (11.5) | 1 (3.1) | 0.498[2] |
| | **Apgar score 5th min <7 n (%)** | 2 (9.1) | 2 (7.7) | 1 (3.1) | 0.612[2] |
| | **Admission to NICU n (%)** | 19 (86.4) | 23 (88.5) | 24 (75.0) | 0.318[2] |

Apgar: Appearance–Pulse–Grimace–Activity–Respiration, NICU: neonatal intensive care unit, PPROM: preterm premature rupture of membranes. Data are presented as mean ± standard deviation or number (%). p<0.05 was considered statistically significant. [1]ANOVA test; [2]Chi-square test. Post-hoc Tukey (ANOVA): c>b>a

**Table 4.** Secondary neonatal outcomes according to latency period and gestational age at PPROM

| Variable | | 3–7 days (n=56) | 8–13 days (n=64) | ≥14 days (n=72) | p-value |
|---|---|---|---|---|---|
| **<24 weeks (n=44)** | **RDS n (%)** | 13 (92.9) | 13 (86.7) | 14 (93.3) | 0.812[1] |
| | **Surfactant treatment n (%)** | 11 (78.6) | 9 (60.0) | 8 (53.3) | 0.248[1] |
| | **BPD n (%)** | 1 (7.1) | 2 (13.3) | 1 (6.7) | 0.722[1] |
| | **Severe NEC n (%)** | 0 (0) | 1 (6.7) | 1 (6.7) | 0.482[1] |
| | **ROP (any) n (%)** | 6 (42.9)[b] | 3 (20.0)[a] | 1 (6.7)[a] | **0.031[1]** |
| | **Advanced ROP n (%)** | 2 (14.3)[b] | 0 (0)[a] | 0 (0)[a] | **0.041[1]** |
| | **PDA n (%)** | 1 (7.1) | 2 (13.3) | 1 (6.7) | 0.734[1] |
| | **Neonatal sepsis (≤72h) n (%)** | 2 (14.3) | 3 (20.0) | 2 (13.3) | 0.869[1] |
| | **Total complications n (%)** | 13 (92.9) | 12 (80.0) | 11 (73.3) | 0.268[1] |
| **24–27+6 weeks (n=68)** | **RDS n (%)** | 12 (60.0)[c] | 11 (47.8)[b] | 4 (16.0)[z] | **0.004[1]** |
| | **Surfactant treatment n (%)** | 6 (30.0) | 6 (26.1) | 2 (8.0) | 0.138[1] |
| | **BPD n (%)** | 0 (0) | 1 (4.3) | 1 (4.0) | 0.612[1] |
| | **Severe NEC n (%)** | 0 (0) | 1 (4.3) | 0 (0) | 0.394[1] |
| | **Advanced ROP n (%)** | 1 (5.0) | 1 (4.3) | 0 (0) | 0.601[1] |
| | **PDA n (%)** | 1 (5.0) | 1 (4.3) | 0 (0) | 0.601[1] |
| | **Neonatal sepsis (≤72h) n (%)** | 0 (0) | 2 (8.7) | 1 (4.0) | 0.312[1] |
| | **Total complications n (%)** | 11 (55.0)[c] | 8 (34.8)[b] | 4 (16.0)[a] | **0.018[1]** |
| **28–31+6 weeks (n=80)** | **RDS n (%)** | 5 (22.7) | 4 (15.4) | 3 (9.4) | 0.398[1] |
| | **Surfactant treatment n (%)** | 2 (9.1) | 2 (7.7) | 2 (6.3) | 0.933[1] |
| | **BPD n (%)** | 0 (0) | 0 (0) | 1 (3.1) | 0.427[1] |
| | **Severe NEC n (%)** | 0 (0) | 0 (0) | 0 (0) | – |
| | **Advanced ROP n (%)** | 0 (0) | 0 (0) | 0 (0) | – |
| | **PDA n (%)** | 0 (0) | 1 (3.8) | 1 (3.1) | 0.562[1] |
| | **Neonatal sepsis (≤72h) n (%)** | 0 (0) | 1 (3.8) | 1 (3.1) | 0.628[1] |
| | **Total complications n (%)** | 6 (27.3) | 6 (23.1) | 6 (18.8) | 0.713[1] |

PPROM: preterm premature rupture of membranes, RDS: respiratory distress syndrome, BPD: bronchopulmonary dysplasia, NEC: necrotizing enterocolitis, ROP: retinopathy of prematurity, PDA: patent ductus arteriosus. Data are presented as numbers (%). Statistical significance was set at p<0.05. [1]Chi-square test. Post-hoc Tukey (Chi-square): c>b>a

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**Table 5.** ROC summary analysis for predicting total neonatal complications

| Marker | Target outcome | Cut-off | Sensitivity | Specificity | AUC | 95% CI | p-value |
|---|---|---|---|---|---|---|---|
| **Gestational age at delivery (weeks)** | **Total neonatal complications** | 30.4 weeks | 0.70 | 0.67 | 0.73 | 0.65–0.80 | **<0.001** |
| **Latency period (days)** | **Total neonatal complications** | 10.0 days | 0.45 | 0.71 | 0.64 | 0.55–0.72 | **0.012** |

ROC: receiver operating characteristic, AUC: area under the curve, CI: confidence interval. ROC analysis was used to evaluate predictors of total neonatal complications

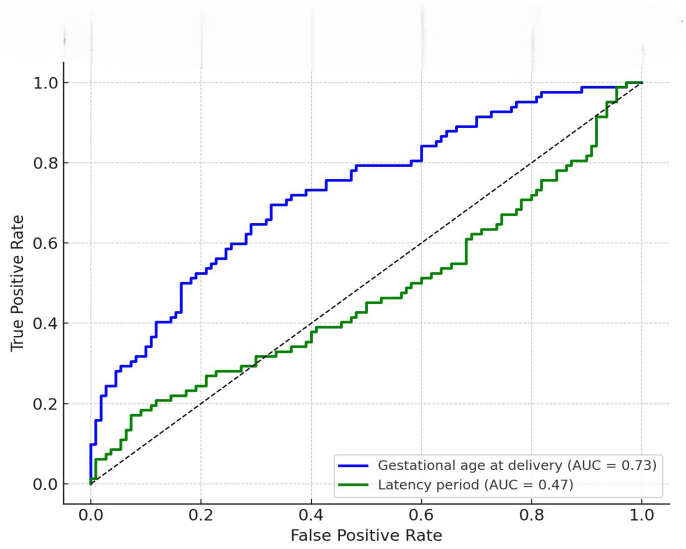


**Figure 1.** ROC curve analysis comparing gestational age at delivery and latency period for predicting total neonatal complications

## Discussion

This study assessed the influence of the latency period on perinatal outcomes in pregnancies complicated by PPROM diagnosed before 32 weeks of gestation. Our findings demonstrated that prolonged latency, particularly in the 24–27+6 week group, improved neonatal prognosis, increased birth weight, and reduced the rates of RDS and overall complications. However, prolonged latency is also associated with increased maternal complications, including higher rates of cesarean delivery, placental abruption, and chorioamnionitis. ROC analysis revealed that gestational age at delivery was the strongest predictor of neonatal complications, whereas the latency period was a weaker but independent predictor.

Our findings partially agree with those of previous reports on the influence of latency on neonatal outcomes in PPROM. Manuck et al. reported that in PPROM cases between 22 and 33.9 weeks, neonatal morbidity was mainly related to infections and not directly associated with the latency period [8]. Similarly, in our study, the latency period did not have a significant impact on neonatal complications in the 28–31+6 week group. In contrast, Melamed et al. found that neonatal morbidity increased when latency exceeded eight days in cases between 28 and 34 weeks [9]. In our study, prolonged latency in the <24-week group conferred limited neonatal benefit, and the incidence of retinopathy was higher in the shorter latency group. This suggests that while prolonged latency may provide additional time for the fetus at very early gestational ages, it may be insufficient to prevent immaturity-related complications in the later stages.

RDS was the most frequent neonatal complication in our study, and its incidence significantly decreased with prolonged latency in the 24–27+6 week gestation group. This can be explained by the time required for antenatal corticosteroids to become effective in the fetus. Previous studies have shown that an expectant approach during early gestation reduces the frequency of RDS. However, some studies have reported that RDS may be associated with PPROM itself, independent of gestational age, and may also occur at later gestational ages [10,11]. These differences suggest that RDS may be linked to prematurity and intrauterine inflammation. The beneficial effects of conservative management on neonatal prognosis have also been reported in the literature. Ruggieri et al. reported that in PPROM cases <30 weeks, protocol-based management significantly prolonged latency (6.5 weeks vs. 1.6 weeks) and consequently resulted in higher gestational age and birth weight at delivery 12. Consistent with this, in our study, prolonged latency in the 24–27+6 week group was associated with increased birth weight and reduced RDS, demonstrating the contribution of conservative management to perinatal outcomes at certain gestational intervals.

The findings on retinopathy of prematurity (ROP) were also noteworthy. In our study, in the <24-week group, the incidence of any-stage and advanced-stage ROP was significantly higher in cases with shorter latency. ROP has primarily been linked to factors such as extreme prematurity, extended oxygen supplementation, and reduced birth weight. More recent evidence has indicated a potential association between ROP and intrauterine inflammation, particularly chorioamnionitis [13]. In our study, some ROP cases were associated with chorioamnionitis, supporting this association. Therefore, both latency duration and the presence of intrauterine infection may play a role in determining the risk of ROP in extremely preterm PPROM cases.

Our findings regarding maternal and obstetric complications were consistent with those of previous studies. In our study, prolonged latency was associated with increased cesarean delivery rates. This can be explained by the higher prevalence of malpresentation in preterm pregnancies, increased incidence of PPROM-related complications, and maternal indications, such as chorioamnionitis, abruption, and cord prolapse.

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Placental abruption was more frequent in the ≥14-day group, whereas chorioamnionitis was more frequent in the 8–13-day group. Previous reports have indicated that chorioamnionitis is associated with prolonged latency and oligohydramnios and may also be linked to neonatal sepsis and low Apgar scores [14]. In our study, chorioamnionitis was associated with increased neonatal complications. The literature further suggests that the duration of latency in PPROM depends not only on gestational age but also on maternal biomarkers and obstetric parameters. Point et al. demonstrated that oligohydramnios, elevated white blood cell count, and increased CRP levels significantly shortened latency duration [15]. The higher rates of placental abruption in the ≥14-day group and increased chorioamnionitis in the 8–13-day group in our study suggest that the maternal risks associated with these biomarkers may become more pronounced with prolonged latency.

Our ROC analysis revealed that gestational age at delivery was the strongest predictor of neonatal complications. With a cutoff of 30.4 weeks, this finding aligns with studies emphasizing the strong association between neonatal morbidity and gestational age [10-16]. The latency period was also statistically significant; however, its lower AUC value suggests that it is not a strong predictor. Thus, our study highlights that clinicians should prioritize gestational age at delivery when evaluating the prognosis of PPROM cases, while considering the latency period as a secondary yet noteworthy factor.

From a clinical perspective, our findings suggest that management strategies for PPROM should be individualized based on gestational age at diagnosis. In the 24–27+6 week group, prolonged latency under close maternal and fetal surveillance may provide significant neonatal benefits, especially by reducing RDS and increasing birth weight. In contrast, in cases <24 weeks, prolonged latency offers limited neonatal advantages and carries a higher risk of complications, such as ROP and chorioamnionitis. For pregnancies beyond 28 weeks, the benefit of latency appears minimal, whereas maternal risks remain unchanged. Therefore, clinical decision-making should balance potential neonatal benefits against maternal risks, and management should be implemented in tertiary centers using a multidisciplinary approach to ensure optimal outcomes.

In evaluating previable PPROM cases, Günes et al. reported that the strongest determinants of neonatal survival were gestational age and birth weight at the time of delivery. In contrast, the most frequent neonatal complications were RDS (56%), ROP (56%), and sepsis (41% of patients). Among maternal complications, chorioamnionitis (24%) and placental abruption (8%) were common [17]. Similarly, in our study, ROC analysis identified gestational age at delivery as the strongest predictor of neonatal complications, whereas RDS and ROP were the most frequent complications in the <24-week group. This parallel highlights that at very early gestational ages, fetal maturity remains the primary determinant of prognosis.

The most distinctive feature of our study is the exclusion of cases that delivered within the first 48 h after PPROM. Thus, all patients benefited from antenatal corticosteroids, ensuring that the outcomes were assessed on a more homogeneous basis. Unlike most studies that analyze PPROM cases as heterogeneous groups, our study stratified patients by gestational age and separately evaluated the impact of the latency period within each group. This allowed us to clearly demonstrate the benefits of latency in the 24–27+6 week group. Furthermore, by employing ROC analysis, we provided not only descriptive findings but also predictive statistical contributions to neonatal outcomes. The evaluation of a homogeneous patient group followed by the same clinical protocols at a single center further enhanced methodological consistency.

Nevertheless, our study has certain limitations. Its retrospective design limits causal inferences. As it was conducted at a single center, generalizability is restricted, and the results may differ across populations in other centers. Subgroup analyses, particularly in the <24-week group, were limited by the sample size, possibly reducing the statistical power for some variables. In addition, histological evaluation of chorioamnionitis was not performed, and only clinical criteria were used, which may limit comparisons with other studies that included histological data. Finally, long-term neonatal neurological outcomes were not included, limiting the implications of our findings on long-term prognosis.

## Conclusion

In conclusion, in pregnancies complicated by PPROM before 32 weeks, gestational age at delivery remains the strongest determinant of perinatal outcomes. Prolonged latency, particularly between 24 and 27+6 weeks, may improve neonatal prognosis but also increases the risk of maternal complications. Therefore, clinical management should be individualized within a benefit–risk framework and implemented by multidisciplinary teams at tertiary centers. Prospective multicenter studies are needed to better define the optimal latency period and validate these findings.

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**Ethical Approval**

*Approved by the Scientific Research Ethics Committee of Bursa City Hospital (No: 2025-13/13; Date: 25 June 2025).*

**Patient Consent**

*Informed consent was waived due to the retrospective design.*

**Conflict of Interest**

*The authors declare no conflict of interest.*

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## References


1. Ohuma EO, Moller AB, Bradley E, et al. National, regional, and global estimates of preterm birth in 2020, with trends from 2010: a systematic analysis. Lancet. 2023;402:1261-71.
2. ACOG Practice Bulletin No. 217. Prelabor rupture of membranes. Obstet Gynecol. 2020;135:e80-97.
3. Linehan LA, Walsh J, Morris A, et al. Neonatal and maternal outcomes following midtrimester preterm premature rupture of the membranes: a retrospective cohort study. BMC Pregnancy Childbirth. 2016;16:25.
4. Kilbride HW, Thibeault DW. Neonatal complications of preterm premature rupture of membranes: Pathophysiology and management. Clin Perinatol. 2001;28:761-85.
5. Suzme D, Ates S, Yener C, et al. Recurrence of premature rupture of membranes among pregnancies admitted to a tertiary hospital: a retrospective cohort study. Arch Gynecol Obstet. 2022;306:1959-65.
6. Lorthe E, Letouzey M, Torchin H, et al. Antibiotic prophylaxis in preterm premature rupture of membranes at 24–31 weeks' gestation: Perinatal and 2-year outcomes in the EPIPAGE-2 cohort. BJOG. 2022;129:1560-73.
7. Thomson A, Royal College of Obstetricians and Gynaecologists. Care of women presenting with suspected preterm prelabour rupture of membranes from 24+0 weeks of gestation: Green-top Guideline No. 73. BJOG. 2019;126.
8. Manuck TA, Maclean CC, Silver RM, et al. Preterm premature rupture of membranes: does the duration of latency influence perinatal outcomes? Am J Obstet Gynecol. 2009;201:414.e1-6.
9. Melamed N, Ben-Haroush A, Pardo J, et al. Expectant management of preterm premature rupture of membranes: is it all about gestational age? Am J Obstet Gynecol. 2011;204:48.e1-8.
10. Walker MW, Picklesimer AH, Clark RH, et al. Impact of duration of rupture of membranes on outcomes of premature infants. J Perinatol. 2014;34:669-72.
11. Van Der Heyden JL, Van Der Ham DP, Van Kuijk S, et al. Outcome of pregnancies with preterm prelabor rupture of membranes before 27 weeks' gestation: a retrospective cohort study. Eur J Obstet Gynecol Reprod Biol. 2013;170:125-30.
12. Ruggieri S, Guido M, Taccaliti C, et al. Conservative management of preterm premature rupture of membranes <30 weeks of gestational age: Effectiveness of clinical guidelines implementation strategies. Eur J Obstet Gynecol Reprod Biol X. 2023;19:100209.
13. Liu PM, Fang PC, Huang CB, et al. Risk factors of retinopathy of prematurity in premature infants weighing less than 1600 g. Am J Perinatol. 2005;22:115-20.
14. Sorrenti S, Di Mascio D, Khalil A, et al. Outcome of prelabor rupture of membranes before or at the limit of viability: systematic review and meta-analysis. Am J Obstet Gynecol MFM. 2024;6:101370.
15. Point F, Ghesquiere L, Drumez E, et al. Risk factors associated with shortened latency before delivery in outpatients managed for preterm prelabor rupture of membranes. Acta Obstet Gynecol Scand. 2022;101:119-26.
16. Nayot D, Penava D, Da Silva O, et al. Neonatal outcomes are associated with latency after preterm premature rupture of membranes. J Perinatol. 2012;32:970-77.
17. Günes A, Kiyak H, Yüksel S, et al. Predicting previable preterm premature rupture of membranes (pPPROM) before 24 weeks: maternal and fetal/neonatal risk factors for survival. J Obstet Gynaecol. 2022;42:597-606.