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*Research Article*

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**An Assessment of the Prevalence and Risk Factors for Premature  
Membrane Rupture**

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**Abstract**

**Background:** *Premature rupture of membranes (PROM) is characterized by the rupture of fetal membranes prior to the onset of true labor pain and is one of the most frequent pregnancy complications. It is a significant contributor to maternal morbidity and neonatal morbidity and mortality. This study aimed to assess the incidence and risk factors associated with PROM among pregnant women.*

**Materials and Methods:** *A prospective observational study was conducted in the Department of Obstetrics and Gynecology. During this period, 8,117 antenatal patients were admitted. Among them, 665 cases were diagnosed with PROM at a gestational age of >28 weeks. Data were collected using semi-structured questionnaires and checklists through interviews.*

**Results:** *PROM was observed in 9.3% of the cases. The highest prevalence (53%) was found in women aged 21–25 years. Most of the patients were housewives (71%), and the majority (61%) had an education level up to secondary school. PROM was more common among women from lower socioeconomic backgrounds (49%), multigravidas (67.2%), and in cases of term PROM (56.3%) compared to preterm PROM (43.6%). Risk factor analysis indicated that the causes were unknown in 48% of cases. Other associated factors included anemia (16%), urinary tract infections (19%), lower genital tract infections (7.2%), a history of PROM (26.3%), malpresentation (15%), multiple pregnancies (6.7%), and diabetes or gestational diabetes (10.5%).*

**Conclusions:** *Identifying and managing the risk factors associated with PROM early can help reduce the incidence of preterm delivery and associated complications, as well as prevent maternal complications like chorioamnionitis.*

**Keywords:** *Premature rupture of membranes, Risk factors, Pregnancy.*

**Introduction**

Premature rupture of membranes (PROM) occurs when fetal membranes rupture before labor begins. PROM is reported in approximately 2.7%–17% of all pregnancies and is responsible for about 35% of preterm deliveries. It can occur either at term ( $\geq 37$  weeks of gestation) or before term ( $< 37$  weeks), in which case it is referred to as preterm premature rupture of membranes (PPROM). The amniotic fluid, which is enclosed by

the membranes, plays a vital role in protecting the fetus. PROM may result from weakened membranes, increased intrauterine pressure, or both. Normally, the tensile strength of the membranes increases until 20 weeks of gestation, plateaus until 39 weeks, and then declines. The membranes are primarily made of connective tissue, and their integrity depends on collagen synthesis, degradation, and structure. Disruptions in collagen structure have been linked to PROM, especially in individuals with connective tissue disorders like Ehlers-Danlos syndrome.

Several clinical and epidemiological factors are linked to PROM. These include reproductive tract infections (e.g., bacterial vaginosis, trichomoniasis, or chorioamnionitis), behavioral factors (e.g., smoking, poor nutrition, or sexual activity during pregnancy), and obstetric complications (e.g., multiple gestation, polyhydramnios, or cervical incompetence). Environmental and genetic factors may also contribute. PROM has serious implications for both the mother and the fetus. Maternal complications may include chorioamnionitis and sepsis, while fetal complications include deformities due to prolonged oligohydramnios and neonatal sepsis. Close monitoring, timely diagnosis, and appropriate antimicrobial treatment are crucial for improving outcomes.

## Materials and Methods

The study was conducted at the Obstetrics and Gynecology Department. Pregnant patients diagnosed with PROM at gestational ages  $>28$  weeks were included. The diagnosis was made based on clinical history, physical examination, and investigations. A sterile speculum examination was performed to confirm amniotic fluid leakage, and ultrasound was used to assess amniotic fluid index (AFI). Vaginal swabs, blood samples, and urine cultures were collected for analysis.

Patients with gestational ages  $<34$  weeks were managed conservatively with antibiotics (erythromycin) and corticosteroids (betamethasone). Patients  $\geq 37$  weeks were monitored for 24 hours; labor was induced if it did not begin spontaneously. Labor was monitored using a partogram, and cesarean delivery was performed if indicated. Data were analyzed statistically using the Chi-square test.

## Results

During the study period, 665 cases of PROM were recorded out of 8,117 antenatal admissions, yielding an incidence of 9.3%. The highest occurrence was in women aged 21–25 years (39%), with 71% being

housewives and 61% having secondary education. PROM was more prevalent in women from lower socioeconomic backgrounds (49%) and among multigravidas (67.2%). Term PROM ( $\geq 37$  weeks) accounted for 56.3% of cases, while preterm PROM ( $< 37$  weeks) accounted for 43.6%.

Etiological analysis revealed unknown causes in 48% of cases. Urinary tract infections were observed in 19% of cases, anemia in 16%, lower genital tract infections in 7.2%, malpresentation in 15%, multiple pregnancies in 6.7%, and diabetes or gestational diabetes in 10.5%. A previous history of PROM was noted in 26.3% of patients.

Table 1: Demographic characteristics of the patients with PROM

SL No	Variables	Categories	No of patients	Percentage
1.	Age(years)	16-18	15	13.6
		21-25	43	39
		26-30	30	27.2
		>30	22	20
2.	Education level	Up to HSC	67	61
		Above HSC	43	39
3.	Occupation	Housewife	78	71
		Employee	32	29
4.	Socioeconomic condition	Low	54	49
		Middle	32	29
		High	24	21.8

Table 2: Obstetric characteristics of the patients.

SL No	Variables	Categories	No of patients	Percentage
1.	Gravity	Primigravida	35	32
		Multigravida	74	67.2
2.	Gestational age	28 weeks-36 weeks+6 days	48	43.6
		>37-42 weeks	62	56.3
3.	Number of fetus	Single	101	92
		Multiple	9	8.1

4.	Past obstetric history	History of PROM	29	26.3
		History of abortion	11	11
		History of MR	5	4.5
		History of D&C	7	6.3

Table 3: Risk factors for PROM.

SL No	Variables	No of patients	Percentage
1.	Idiopathic	53	48
2.	UTI	21	19
3.	Anemia	18	16
4.	DM and GDM	7	6.3
5.	Malpresentation	6	5.4
6.	Lower genital tract infection	8	7.2
7.	Abnormal vaginal discharge	15	13.6

Table 4: Mode of Delivery.

SL No	Variables	No of patients	Percentage
1.	LUCS	74	67
2.	NVD	36	32.7

## Discussion

The incidence of PROM varies depending on socioeconomic and healthcare factors. In this study, the incidence of PROM (9.3%) aligns with findings from previous studies in similar settings. Younger women, particularly those aged 21–25 years, had the highest incidence, likely due to early childbearing practices. Most patients were from low socioeconomic backgrounds, indicating the impact of poverty and limited access to healthcare.

Idiopathic causes were the most common, highlighting the need for further research into PROM etiology. Urinary tract infections, anemia, and genital tract infections were significant risk factors, consistent with findings from other studies. A history of PROM emerged as the strongest risk factor, possibly due to untreated infections or cervical insufficiency.

## Conclusion

The findings highlight the critical role of antenatal care in identifying and managing PROM risk factors. Addressing socioeconomic disparities, improving maternal nutrition, and increasing awareness can significantly reduce PROM-related complications. Proper diagnosis and timely intervention are essential to ensuring better maternal and neonatal outcomes.

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