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# ASSESSING OUTCOMES AFTER INDUCTION OF LABOUR FOR PREMATURE RUPTURE OF MEMBRANES: NORMAL VAGINAL DELIVERY VS LSCS


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**KEYWORDS :**

Premature rupture of membranes (PROM) refers to the spontaneous rupture of the amniotic sac before the onset of labor, which occurs in about 3-10% of pregnancies. It can lead to complications such as infection, placental abruption, and fetal distress if not managed appropriately. When PROM occurs preterm (before 37 weeks), it is referred to as preterm premature rupture of membranes (PPROM). In cases of PROM, labor is typically induced to reduce the risk of infection, especially after 34 weeks of gestation (1). The method of delivery, whether normal vaginal delivery or lower segment cesarean section (LSCS), remains a crucial decision point, as it influences maternal and fetal outcomes (2).

Induction of labor in women with PROM can result in either successful vaginal delivery or LSCS if complications arise, such as failed induction, fetal distress, or maternal exhaustion. The decision to induce labor and the mode of delivery depends on several factors, including gestational age, fetal presentation, maternal conditions, and the presence of any infection or fetal compromise (3). Despite significant advances in obstetric care, determining the appropriate mode of delivery after labor induction in cases of PROM remains a clinical challenge.

### Need for the Study

There is limited data comparing the outcomes of labor induction in cases of PROM, particularly with regard to mode of delivery and fetal outcomes. The study aims to address the gap in understanding how many patients progress to normal vaginal delivery versus LSCS after induction of labor. Furthermore, it seeks to assess fetal outcomes, particularly those requiring neonatal ICU admissions, such as neonatal respiratory distress syndrome (RDS), neonatal sepsis, and transient tachypnea of the newborn (TTN). By analyzing these outcomes, this study may help in improving decision-making for labor management and reducing both maternal and fetal morbidity associated with PROM (4,5).

### Objectives

1. To determine the mode of delivery after induction of labour for premature rupture of membranes.
2. Fetal outcome requiring ICU admission (eg:ARDS, neonatal sepsis,tachypnea of new born)

## MATERIAL AND METHODS

A retrospective study was conducted over a period of three months (from April to June,2024) in the Department of Obstetrics and Gynaecology, KVG Medical College and Hospital, Sullia, Karnataka, India. The study focused on women who experienced premature rupture of membranes (PROM) and underwent induction of labor, aiming to assess the mode of delivery and maternal and fetal outcomes. Ethical approval was obtained from the institutional ethics committee prior to the commencement of the study.

Study Population: The study population consisted of pregnant women admitted to the labor ward with a diagnosis of PROM who subsequently underwent labor induction. PROM was defined as rupture of membranes before the onset of labor, confirmed by clinical examination and diagnostic tests such as the sterile speculum examination and nitrazine test, wherever applicable. Inclusion criteria included:

- Singleton pregnancy.
- Term pregnancy (≥37 weeks of gestation).
- Cephalic presentation.
- PROM diagnosed without the onset of spontaneous labor within 24 hours.

Women with pre-existing medical conditions (such as diabetes, hypertension, or heart disease), multifetal pregnancies, or those with contraindications to vaginal delivery (e.g., placenta previa) were excluded from the study.

### Data Collection

Data was collected retrospectively from the medical records of the patients who underwent induction of labor following PROM. The hospital records provided information on the patient demographics, obstetric history, gestational age, type of induction agent used, and the time between PROM and induction. Detailed delivery records were analyzed to determine the mode of delivery (normal vaginal delivery or lower segment cesarean section [LSCS]) and assess the maternal and fetal outcomes.4

Induction Protocol: The induction of labor was conducted following the standardized protocol established at the hospital. Induction agents used included:

1. Prostaglandin E2 (PGE2) gel: Applied intravaginally, where patients showed an unfavorable cervix (Bishop score <6).
2. Prostaglandin E1(PGE1),Misoprostol:Given trans-vaginally or orally for induction of labour
3. Oxytocin infusion: Initiated in patients who showed a more favorable cervix or following cervical ripening with PGE2.

The choice of induction agent was based on the attending obstetrician's clinical judgment and the patient's cervical status at the time of admission. Continuous fetal heart rate monitoring and regular maternal assessments were performed during labor to monitor the progression of labor and the well-being of both the mother and fetus. Outcome Measures: The primary outcome measure was the mode of delivery, categorized into normal vaginal delivery (NVD) and lower segment cesarean section (LSCS). The decision to perform LSCS was made based on specific clinical indications such as fetal distress, failed induction, or labor dystocia. Neonatal outcomes: APGAR score at 1 and 5 minutes, admission to neonatal intensive care unit (NICU), or any neonatal morbidity.

### Statistical Analysis

Data was analyzed using [mention specific statistical software, if used]. Descriptive statistics, including frequencies and percentages, were used to summarize categorical variables. Continuous variables were presented as mean ± standard deviation. Chi-square tests were applied to compare the rates of vaginal delivery and LSCS. A p-value of $<0.05$ was considered statistically significant.

**Results:**

**Table 1: Distribution of Subjects**

| | | Count | % |
|---|---|---|---|
| Age | 20-25 years | 8 | 26.7% |
| | 26 to 30 years | 15 | 50.0% |
| | 31 to 35 years | 7 | 23.3% |
| Type of Delivery | NVD | 15 | 50.0% |
| | LSCS | 15 | 50.0% |

**Table 2: NICU Admission Rate with Respect to Type of Delivery**

| | | Type of Delivery | | | | P value |
|---|---|---|---|---|---|---|
| | | NVD | | LSCS | | |
| | | Count | % | Count | % | |
| NICU admission | Yes | 1 | 6.7% | 4 | 26.7% | 0.142 |
| | No | 14 | 93.3% | 11 | 73.3% | |

**Pearson Chi-Square Tests**

In the present study, the majority of subjects were in the age group of 26 to 30 years, comprising 50.0% of the total participants. This was followed by 26.7% of the participants in the age group of 20 to 25 years and 23.3% in the 31 to 35 years age group.

Regarding the type of delivery, 50.0% of the deliveries were Normal Vaginal Delivery (NVD), while the remaining 50.0% were Lower Segment Cesarean Section (LSCS).

In relation to NICU admissions, it was observed that 6.7% of the NVD group had NICU admissions, compared to 26.7% in the LSCS group. However, this difference was not statistically significant, as indicated by a p-value of 0.142 ($p > 0.05$), suggesting no strong association between the type of delivery and the likelihood of NICU admission.

## DISCUSSION

The present study revealed that 50.0% of the subjects delivered via Normal Vaginal Delivery (NVD), while the remaining 50.0% underwent Lower Segment Cesarean Section (LSCS). This distribution aligns with findings from other studies on premature rupture of membranes (PROM), where a significant proportion of women underwent cesarean section due to various maternal and fetal indications. For example, a study by Naef et al. (6) found a comparable cesarean section rate in PROM cases, attributing this to concerns regarding maternal and fetal well-being, as well as the avoidance of prolonged labor.

NICU admissions were higher in the LSCS group (26.7%) compared to the NVD group (6.7%), although this difference was not statistically significant ($p = 0.142$). This finding contrasts with some literature, which suggests that cesarean section may increase the risk of respiratory complications in neonates, thus leading to higher NICU admissions (7,8). The increased NICU admission rates in cesarean deliveries may be attributed to factors such as the absence of labor, which deprives neonates of the physiological hormonal benefits that facilitate lung maturation and fluid clearance during vaginal delivery (9).

However, other studies have also shown no significant difference in neonatal outcomes, including NICU admissions, between NVD and LSCS deliveries in the context of PROM (10,11). The lack of statistical significance in this study could be due to the relatively small sample size, which may limit the power to detect subtle differences. Larger studies are required to confirm the association between delivery mode and NICU admissions in PROM cases.

The variation in the cesarean section rates and NICU admissions in different studies could be explained by several factors, including differences in the criteria for cesarean section, labor management protocols, and the gestational age at the time of delivery. Additionally, variations in neonatal outcomes may depend on the availability of neonatal intensive care facilities and institutional policies regarding the management of PROM.

## CONCLUSION

The study found higher NICU admissions in the LSCS group, the difference was not statistically significant. The choice of delivery mode in cases of PROM should consider individual maternal and fetal conditions, with a focus on optimizing neonatal outcomes.

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