



## **A clinical study of maternal and perinatal outcome in premature rupture of membranes at term gestational age.**

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### **Abstract :**

**Back ground :** Premature rupture of membranes (PROM) is linked to serious maternal and neonatal problems, which necessitates careful intervention to prevent maternal & perinatal morbidity and mortality. It is very essential to analyse the basic epidemiology, demographic incidence, aetiology, risk factors, relevant disease subsets, diagnosis, morbidity, mortality and outcomes of PROM for better management of patients with the PROM and for designing studies to evaluate potential therapies.

**Aim :** the aim was the maternal and perinatal outcome in premature rupture of membranes at term gestational age.

**Objectives:** 1. To study the maternal morbidity and mortality in premature rupture of membranes at term gestation. 2. To study the perinatal morbidity and mortality in premature rupture of membranes at term gestation.

**Material and methods :** the study was carried out in government maternity hospital, Tirupati. Patients were included into study after written informed consent from the patients. A prospective hospital-based study was undertaken on 200 cases with "PROM" at or above 37 weeks. Detailed history was taken, Physical examination, obstetric examination and systemic examination was performed. History regarding demographics, socioeconomic status, past history, medical history was recorded. Abdominal examination for number of the fetus, fetal presentation, fetal heart rate, presence of uterine action was performed. The mode of delivery was planned according to other obstetric factors. Interval between PROM and onset of labor was noted. Progress of the labor was monitored. The fetal condition was monitored. If labor was progressing with adequate uterine action, expectant management was done. If any Labor complications prolonged labor, obstructed labor, cord prolapse, any arrest disorders, dry labor, labor dystocia, retained placenta, postpartum haemorrhage were noted. Maternal complications like failed maternal forces, subinvolution, and haemorrhage were noted.

**Results:** In the study included people of all ages. 20-24 years old was the most common age group for spontaneous PROM. The term PROM was more common than PPRM, and the majority of the women were multigravida. The rate of caesarean section was high. Subclinical urogenital infection was the most common complication (53 %), followed by oligohydramnios (25 %) and chorioamnionitis (13.5 %). There was a link between increased PROM duration and a higher risk of fetal outcomes, and the presence of meconium-stained liquor. In the present study perinatal morbidity was 24% and the mortality rate was 0.5%., RDS was seen in 14 % (n=28) of babies. Among these babies, 22 babies were admitted to SNCU. 6 babies were admitted to NICU.

**Conclusion :** PROM is a complicated obstetric condition that affects 5-10% of all pregnancies and there is risk of maternal, perinatal morbidity & mortality. To decrease the morbidity and mortality associated with PROM at term pregnancy, early diagnosis, proper monitoring and management is essential.

**Key words :** prom ,maternal morbidity, perinatal morbidity, oligohydramnios , urogenital infection.

### **Introduction :**

Premature rupture of membranes (PROM) or pre-labor rupture of membranes refers to the rupture of membranes before the onset of labor. It is associated with a high risk of maternal and neonatal morbidity and mortality. PROM is characterized by the spontaneous rupture of the fetal membranes at least one hour before the onset of labor.

It can happen at any time during pregnancy, whether it's full term (37 weeks or more) or preterm (37 weeks or less). Final pathway of parturition consists of three components. Cervical ripening, activation of myometrium, and activation of fetal membranes are the three components. These components are normally activated at the same time in normal term pregnancy. In PROM, activation of fetal membranes occurs before the activation of the other two components. A series of metabolic activities culminate in membrane rupture, which causes the fetal membranes to separate from the decidua in the uterus.

Premature activation of parturition pathways results in Preterm PROM. Inflammation or inflammation along with infection is the underlying pathological processes that are linked to PROM. The etiological factors that are associated with PROM include low socioeconomic status, underweight, use of tobacco, history of PROM in a previous pregnancy, infections such as urinary tract infections, genital tract infections, bleeding per vagina at any time in pregnancy, cervical cerclage, and diagnostic and therapeutic procedures such as amniocentesis.<sup>1</sup>

The majority of Indian studies found that 8% of all term pregnancies (> 37 weeks) are complicated by PROM. Prolonged PROM occurs in 20% of these pregnancies. In 70 % of cases, labour occurs spontaneously within 24 hours. In 85 % it occurs within 48 hours and in 95 % of pregnancies, spontaneous labour occurs within 96 hours.

PROM is linked to serious maternal and neonatal problems, which necessitates careful intervention to prevent maternal & perinatal morbidity and mortality. It is very essential to analyse the basic epidemiology, demographic incidence, aetiology, risk factors, relevant disease subsets, diagnosis, morbidity, mortality and outcomes of PROM for better management of patients with the PROM and for designing studies to evaluate potential therapies. Hence, we are taking the present study to analyse the occurrence of PROM, labour outcome, maternal outcome, and perinatal outcome in premature rupture of membranes at term pregnancies among the Indian population. So that this research study may be used to find the best way to manage PROM in the future to reduce maternal and foetal morbidity and mortality.

**Classification of PROM:** 1) Premature rupture of membranes (PROM): Rupture of the foetal membranes at least one hour before the onset of labour 2) Prolonged PROM: premature rupture of membranes with a time lag of more than 24 hours between the rupture and the commencement of labour. 3) Preterm Premature Rupture of Membranes (PPROM): rupture of membranes before 37 weeks of pregnancy. 4) Pre-viable PPRM, also known as mid-trimester PROM, is a premature rupture of the membranes that occurs before the foetus reaches 24 weeks gestational age.

**Signs and symptoms of prom :** The majority of women experience a painless gush of fluid from the vagina. Instead of a clear "gush," some women feel a constant flow of little volumes of watery discharge. Other symptoms include a change in colour and consistency of fluid coming out of the vagina, flecks of meconium in the fluid, or a decrease in the fundal height.

**Signs and symptoms of chorioamnionitis:**

1. spikes of fever with temperature  $>100.4^{\circ}\text{F}$  or  $>37.8^{\circ}\text{C}$  along with any two of the following:
2. Significant maternal tachycardia ( $>100$  beats per minute [bpm])
3. Foetal tachycardia ( $>160$ - $180$  bpm)
4. Foul-smelling and purulent vaginal discharge
5. Uterine tenderness
6. leucocytosis (total blood leukocyte count  $>15,000$ - $18,000$  cells/ $\mu\text{L}$ )
7. Elevated C reactive protein.

**Diagnosis of PROM:** Confirming that the fluid leaking from the vagina is amniotic fluid is important and make sure that labour has not yet started. Record the demographic history, proper clinical history, past history, obstetric history and performing a obstetric examination, sterile per speculum examination, ultrasonography and should confirm the diagnosis. The women with PROM had usually complaint of sudden gush from the vagina or slow and steady leak of fluid from the vagina.

**COMPLICATIONS OF PROM :**

- a) Maternal complications:** Abruption, instrumental delivery, operative delivery, postpartum haemorrhage, retained placenta, and uterine subinvolution, puerperal sepsis, endometritis, increased rate of recurrence in subsequent pregnancy, rarely rupture uterus in the postnatal period.
- b) Foetal-complications:** Non-reassuring foetal heart rate pattern on NST reflecting umbilical cord compression due to oligohydramnios, low APGAR score, perinatal asphyxia, foetal distress, hyaline membrane disease, neonatal sepsis., convulsions, increased need of resuscitation measures, increased need of SNCU/NICU admissions, perinatal mortality.

**MATERIALS AND METHODS :**

**SOURCE OF DATA:** Patients were admitted to the department of obstetrics and gynaecology, Government Maternity Hospital, Tirupati during the period from December 2020 to December 2021.

**METHOD OF COLLECTION OF DATA:** A prospective hospital-based study was undertaken on 200 cases with "PROM "at or above 37 weeks in the department of obstetrics and gynaecology, Government maternity hospital, Tirupati during the period from December 2020 to December 2021. Patients with pre-defined criteria were confirmed and selected for the study. Any ambiguity regarding the diagnosis or aetiology of PROM will be reviewed by two independent clinicians. Patients will be excluded from the study if ambiguity could not be resolved. Data was recorded.

Any clinical indications of chorioamnionitis were noted. The presence of amniotic fluid was detected using a sterile speculum inspection without the use of antiseptics, and a high vaginal swab was collected and sent for culture and sensitivity. single and careful per vaginal examination was done to assess the BISHOP”s score and to rule out Cephalo pelvic disproportion. AFI by ultrasonography was recorded, foetal monitoring done by CTG. All cases were given prophylactic iv antibiotics mostly cephalosporins. The mode of delivery was planned according to other obstetric factors. Interval between PROM and onset of labour was noted. Progress of the labour was monitored.

Admission and recovery duration was recorded. Any Maternal morbidity after delivery such as postpartum haemorrhage, fever, wound infection, sepsis, etc was noted. mothers were observed for the onset of complications during labour, after delivery till the discharge.

**INCLUSION CRITERIA:**

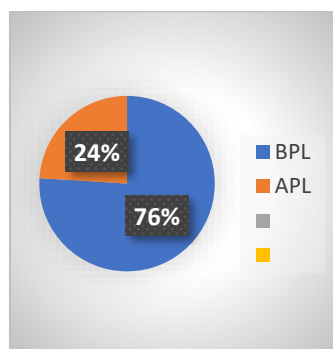
- Gestational age of  $\geq 37$  wks. confirmed by dates, clinical examination and ultrasound.
- Labour does not set in.
- Singleton pregnancy
- Vertex presentation
- Those who have given written consent.

**EXCLUSION CRITERIA:**

- Congenital anomalies
- Intrauterine Death
- Multiple Gestation,
- Medical disorders like pregnancy-induced hypertension, gestational diabetes, etc.
- previous LSCS,
- Gross contracted pelvis.
- Those who have not given consent.

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurement are presented on mean age and results on categorical measurements are presented in frequencies and percentages. Significance is assessed at 5% level of significance . Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups. The Statistical software namely SPSS 22.0, were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

**Results :** socioeconomic status diagram:1



Among the study population, “PROM” cases were higher in the below poverty line group contributing to 152 cases that are 76%, whereas 48 cases that are 24% belonged to the above poverty line.

Literacy	No of patients	Percentage
Illiterate	40	20%
Primary Education	76	38%
secondary education	52	26%
Under Graduate	24	12%
Post Graduate	8	4%
Total	200	100%

Table:1 The above table shows that among the study population, 40% (n=80) were illiterates, 76% (n=152) were studied up to primary education, 52% (n=104) studied up to secondary education, 24% (n=48) were undergraduates and 8% (n=16) were post graduates.

**Obstetric score : table:2**

Gravida	Number	Percentage
Primi	116	58%
Multi	84	42%
Total	200	100%

The above table shows that 58% (n=116) of the study population were primigravida and 42% (n=84) of the study population were multigravida.

**Amniotic fluid Index :** below table shows that among the study population, in 42 % (n= 82) of the cases AFI was about 8-10, in 30.5% (n=61) AFI was about 6-8, in 25% (n=50) AFI was about <5, in 2.5 % (n=5) of the cases AFI was about >10, in 1% (n=2) of the cases, AFI was NIL.

Table:3

AFI in Cm	Number	Percentage
>10	5	2.5
08 to 10	82	41
6 to 8	61	30.5
<5	50	25
Nil	2	1
Total	200	100

In both primigravida and multigravida, the highest number of women had a BISHOPS score of 3-4, as seen in the table above. It is statistically significant at P<0.05 level table:4

BISHOP score Pimi	Column1	Multi	Column2	Column3
	Number	%	Number	%

0 to 2	12	10.35	0	0
3 to 4	83	71.55	36	42.86
4 to 5	21	18.1	48	57.14
Chi-Square	x <sup>2</sup> =5.006*(p=0.025) df=1.			

\*Significant at 0.05level

**PROM to delivery interval : table:5**

Time in Hours	Primi Number	Column1 Percentage	Multi Number	Column2 Percentage
0 to 6	6	5.17	8	9.52
6 to 12	16	13.79	14	16.67
12 to 24	72	62.07	51	60.71
>24	22	18.97	11	13.1
	116	100	84	100
Chi-square	x <sup>2</sup> =2.618 @ (p=0.454)df=3			

@ not significant

In both primigravida and multigravida, the most number of women delivered within 12-24 hours, with the shortest delivery interval of 2 hours, as seen in the table above. In primigravida, 62.07 % of the primigravida population delivered between 12 and 24 hours; in multigravida, 60.71 % of the multigravida population were delivered between 12 and 24 hours. The average time from PROM to delivery interval is 20.74 hours. It is not statistically significant.

**Relation between PROM to delivery interval & maternal and neonatal morbidity :**

The time between PROM and delivery affects the mother and foetal morbidity. The longer the time between PROM and birth, the higher the risk of foetal and maternal morbidity. 56.4% of maternal morbidity occurred with PROM to a delivery interval of greater than 24 hours. Foetal morbidity was 62.5% with interval greater than 24 hours duration.

Table:6

Duration (Hrs)	Maternal Num	Column1 %	Foetal Num	Column2 %
0 to 6	0	0	0	0
6 to 12	2	5.1	0	0
12 to 24	15	38.4	18	37.5
>24	22	56.4	30	62.5

**Discussion :** PROM is a common complication of pregnancy that leads to significant maternal, foetal morbidity and mortality. The present study was undertaken to detect maternal and foetal outcomes in term pregnancies in Government Maternity Hospital, Tirupati. In this study, the term PROM was more common than PPRM, and the majority of the women were multigravida. The rate of caesarean section was high. Subclinical urogenital

infection was the most common complication (53 %), followed by oligohydramnios (25 %) and chorioamnionitis (13.5 %).

The study included people of all ages. 20-24 years old was the most common age group for spontaneous PROM. In our country, early marriages and pregnancy are likely to be the source of the study's lower common age group. The embryonic membranes tensile strength deteriorates as a result of low nutritional status, which is influenced greatly by the socioeconomic situation of patients.

Patients with poor socioeconomic levels may have lower antimicrobial activity in their amniotic fluid, which could explain why they have a greater rate of PROM. PROM is significantly increased by low socioeconomic status and associated variables such as malnutrition, inadequate hygiene, stress, high parity, recurrent genitourinary infections, and anaemia. The duration of PROM with latent period was found to be strongly linked to adverse outcomes. PROM causes complications in both the mother and the neonate as the duration of PROM prolongs. Mother morbidity was statistically significantly affected by the duration between PROM and delivery. The longer the interval between PROM and delivery, the higher the chance of maternal morbidity. Maternal morbidity is due to intrapartum infection which results from the spread of ascending genital infection to the amniotic cavity due to the absence of the protective barrier of amniotic membranes in cases of PROM.

**Conclusion :** PROM is a complicated obstetric condition that affects 5-10% of all pregnancies and there is risk of maternal, perinatal morbidity & mortality. As the gestational age reduces and the latent period lengthens, complications become more pronounced. The important elements to limit the adverse consequences of PROM are the assessment of etiological risk factors, confirmation of the diagnosis, and prompt management of the cases. It is very important to educate every woman about the importance of regular antenatal care, which includes nutrition, personal hygiene and the importance of regular antenatal visits and recommendations.

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