


Original Research Article

# Compare the maternal and fetal outcomes in expectant versus active management

B. Vijetha<sup>1</sup>, N. Suvidha<sup>2\*</sup>

<sup>1,2</sup>Post Graduate Student, Department of Gynecology and Obstetrics, Gandhi Medical College, Secunderabad, India

\*Corresponding author email: [dr.abhilash.gmc@gmail.com](mailto:dr.abhilash.gmc@gmail.com)

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## Abstract

**Background:** Premature Rupture of Membranes (PROM) refers to rupture of membranes with leakage of amniotic fluid before the onset of labour.

**Aim:** To compare the maternal and fetal outcomes in Expectant Versus Active Management, to study the incidence of PPRM (Preterm Premature Rupture of Membranes) at our hospital.

**Materials and methods:** Study was conducted in 100 patients with confirmed diagnosis of PPRM with per speculum/ vaginal PH. The present study included both booked and unbooked cases. 50 patients were recruited for expectant and the other 50 for other management.

**Results:** Incidence of PPRM in the study was 2.2%. Majority were in the age group of 21 – 25 years and more observed in multigravida. There was fourfold increase in incidence of cesarean section with the major indication being fetal distress in both the groups. Pathological flora was detected in 30% of cases. PPRM was more in gestational age between 34 – 36 weeks. Incidence of perinatal mortality was 15%. Incidence of perinatal mortality was increased in actively managed cases compared to conservatively managed cases. Major cause of perinatal mortality in actively managed cases was Respiratory Distress. Major cause of perinatal mortality in conservatively managed cases was Septicaemia.

**Conclusions:** Incidence of PPRM which can significantly affect the mother and fetus can be reduced by early screening, adequate antenatal visits, improvement of general condition of mother and treating the associated complications.

## Key words

Preterm Premature Rupture of Membranes, Perinatal mortality, Respiratory Distress.

## **Introduction**

Premature Rupture of Membranes (PROM) refers to rupture of membranes with leakage of amniotic fluid before the onset of labour [1]. If this occurs before 37 weeks of gestational age it is called as Preterm Rupture of Membranes (PPROM) [2].

The incidence of PROM is 10% in term pregnancies and 10% to 15% of all deliveries. 70% of these cases occur at term and 30% occur before term. Preterm Rupture of Membranes (PPROM) occurs in 3% of all pregnancies and is responsible for approximately 30% of all preterm deliveries with high perinatal morbidity and mortality.

Preterm PROM is classic case when a normal pregnancy suddenly becomes high risk one for the mother and fetus. For patients with PPRM the most likely outcome is preterm delivery and its associated morbidity in both mother and baby such as respiratory distress, necrotizing enterocolitis, Intraventricular hemorrhage and sepsis in fetus and maternal risk of cord prolapse, cord compressions, chorioamnionitis, endometritis, Abruptio Placenta, retained placenta and postpartum haemorrhage.

Low socioeconomic status, infections, preterm labour in previous pregnancies and malpresentation of the fetus increase the risk of PPRM [3]. The issue whether to manage PPRM expectantly or actively is controversial.

The purpose of this study is to observe the ongoing maternal and fetal indicators of infection while prolonging pregnancy in patients with PPRM between 32-36 weeks of gestation age with a view to improve the maternal and neonatal outcome.

## **Materials and methods**

### **Source of data**

Study was conducted in Gandhi Hospital in women reporting to the Obstetrics and Gynecology Department with PPRM with

singleton pregnancies and gestational age of 32 – 36 weeks were recruited for Expectant/Active Management based on the inclusion and exclusion criteria for the study. Study was conducted in 100 patients with confirmed diagnosis of PPRM with per speculum/ vaginal PH. Each case was managed as per the protocol. The present study included both booked and unbooked cases. 50 patients were recruited for expectant and the other 50 for other management.

**Inclusion criteria:** Singleton Pregnancy, Gestational Age 32 – 36 weeks, Cervical length > 2 cm and os <3cm, Confirmed diagnosis of PPRM by perspeculum examination or by vaginal pH.

**Exclusion Criteria:** Multiple pregnancy, Medical disorders like hypertension, Diabetes Mellitus, Connective tissue disorders like SLE, Renal disorders, Liver disease, Heart disease, Maternal infection at the time of admission as evidenced by temperature > 100° F, pulse rate > 100/min, uterine tenderness, foul smelling liquor, fetal tachycardia > 169/min, Antepartum haemorrhage, placenta previa, abruptio placenta and Fetal anomalies.

### **Method of collection of data**

A detailed study – history of all the 100 patients was taken including age, occupation, socio-economic status, history of infections, duration of leak, complete obstetric history, menstrual history with reference to regularity of cycles, date of last menstrual period of women were recorded. Presence of predisposing factors like history of PROM in previous pregnancies, history of sexual contact within a period of 7 days before leak, History of smoking or tobacco chewing were recorded. Period of gestation was calculated from Naegeles rule in patients with known last menstrual period, otherwise assessed by clinical examination and ultra sound. Patient's general physical examination was done. Vitals are recorded. Cardiovascular system and respiratory system examined.

### **Obstetric examination**

Uterine height, presentation, position, lie of the fetus, liquor volume, fetal heart rate were recorded. Uterine contractions were clinically evaluated with respect to frequency intensity and duration and then conformed by CTG.

### **Per speculum examination**

Sterile Speculum examination without using any antiseptic was undertaken to reveal presence or absence of Amniotic Fluid leaks through the cervix with/without fundal pressure/cough.

### **Per vaginal examination**

A sterile digital examination was done to evaluate cervical effacement, dilatation, consistency, presence or absence of cord prolapse. Diagnosis of Leakage is by Per speculum examination, Vaginal pH and Amniotic Fluid Index.

At the time of admission Ultrasonography and Non Stress Test (NST) was done for all the 100 cases. Initial laboratory assessment includes a complete blood picture, to determine the total number of white blood cells, differential count and determination of C-reactive protein. Blood grouping and Rh typing, HIV, HBsAg, cervical swab or high vaginal swab for culture and sensitivity, urine for culture and sensitivity were sent.

Clinical diagnosis of amnionitis was made when patients of PPRM developed fever with uterine tenderness and irritability with or without foul smelling liquor and in the absence of any other obvious cause of fever. Patients with amnionitis are not included in the study. They are managed Actively by termination either by cesarean section or induction with prostaglandins or oxytocin based on per vaginal findings after administering antibiotics (Triple antibiotics – TAXIM, Gentamycin and Metrogl).

### **Protocol for active management**

For all the 50 patients in the study steroids and prophylactic antibiotics were given and pregnancy was terminated 48 hours. After the

first dose of the steroid, Corticosteroid inj. Betamethasone 12 mg IM 2 doses were given 24 hours apart. Inj. TAXIM – 500 IV BD were given. Mode of termination depends on the favourability of cervix and other maternal and fetal obstetric indications. Patients in the study were followed up daily. They were advised bed rest, pad for observation to observe amount, colour and smell of liquor and evidence. Both in conservative and active management outcome of maternal morbidity in form of Puerperal pyrexia, Wound infection and Chorioamnionitis; perinatal mortality and perinatal morbidity in the form of respiratory distress, septicemia, conjunctivitis and umbilical sepsis; mode of delivery and duration of hospital stay were studied and compared.

All the new born babies in both active and conservative management are examined by the neonatologist for gestational age assessment, APGAR Score, birth weight, temperature and their perinatal outcome was followed up till baby gets discharged.

All the mothers in both active and conservative management was followed up in the puerperium till she gets discharged by monitoring 4<sup>th</sup> hourly temperature, noting smell and colour of lochia, staining of diaper by lochia. Rate of involution of uterus as well as the signs and symptoms of systematic complications like endometritis, wound sepsis, peritonitis were also noted. In case of fever breast engorgement, urinary tract infections and respiratory tract infections were ruled out. Data regarding each case was noted in the proforma and results were analysed.

### **Results**

Out of 9800 patients delivered during the study period of one year 220 had PPRM; giving the incidence of 2.2% in our hospital. Out of these 100 patients were included in the study and results are analysed.

This study group included Antenatal women with PPRM between 16-40 years of age group. The

above table shows that 21 – 25 years was the common age group as 46% of patients were between this age group. 65% multigravida while 35% cases were primygravida. Incidence of PPROM was high among unbooked cases. Incidence of PPROM was high in cases with gestational age between 34 – 36 weeks. PPROM was common with vertex presentation. Among the PPROM cases with non-vertex presentation breech was found to be common (**Table – 1**).

**Table – 1:** Demographic distribution of cases.

Maternal Age	No. of cases	%
16 – 20	24	24%
21 – 25	46	46%
26 – 30	22	22%
31 – 35	6	6%
36 – 40	2	2%
<b>Gravida</b>		
Primi	35	35%
2 <sup>nd</sup> and 3 <sup>rd</sup>	54	54%
4 <sup>th</sup>	11	11%
Unbooked	62	62%
Booked	38	38%
<b>Gestational Age</b>		
32 – 34 Weeks	36	36%
34 – 36 Weeks	64	64%
<b>Presentation</b>		
Vertex	64	64%
Non-Vertex	36	36%

Among the 50 patients 21 were delivered without any augmentation within 48 hrs of the first dose of steroid and in remaining 29 patients pregnancy was intervened either by Cesarean section are by induction with oxytocin or prostaglandins based on the bishops score.

Among the 29 cases for which pregnancy was induced after 48 hours of the first dose of the steroid 15 cases were terminated by LSCS.

Overall in 25 cases 15 cases were induced with oxytocin and 10 cases with prostaglandin (Misoprostol) based on the favourability of the cervix. Among 15 cases induced by oxytocin 11 cases delivered vaginally and 4 cases delivered

by LSCS. Among 10 cases misoprostol 3 cases delivered vaginally and 7 cases delivered by LSCS. It was found that induction with misoprostol increased that rate of LSCS due to fetal distress.

Vaginal delivery was the commonest mode in active management of PPROM. Maximum duration of hospital stay in active management was 10-12 days.

Among the 50 cases managed conservatively 26 cases delivered by vaginal delivery and 24 cases delivered by LSCS. Among the 50 cases 21 cases were induced and the remaining 29 cases had spontaneously set in to labour. Majority of the cases were induced for fetal distress and for maternal signs and symptoms of chorioamnionitis. It was found that among those induced by Misoprostol LSCS rate was high with the major indication being fetal distress during labour. Among the 29 cases which spontaneously set into labour 17 cases delivered vaginally and 12 cases were terminated by LSCS with fetal distress being the indication in majority. Vaginal delivery was the commonest mode of delivery in both active and conservative management of PPROM (**Table – 2**).

Commonest indication for cesarean section was fetal distress in both conservative and active management. Most of the cases of PPROM were Idiopathic. Increased incidence was seen in patients with cervico vaginal infection, urinary tract infection (**Table – 3**).

The prevalence of organism in case of PPROM was as per **Table - 4**. Normal vaginal flora were found in majority of cases.

Incidence of Peuperal Pyrexia and chorioanmionitis was high in conservative management. Incidence of wound infection was high in active management. Maximum duration of hospital stay in active management was 10-12 days. Maximum duration of hospital stay in conservation management was 20- 25 days (**Table – 5**).

**Table – 2:** Mode of delivery in active and conservative management.

<b>Active Management</b>		<b>Total</b>	<b>Vaginal</b>	<b>LSCS</b>
a) Induced	Oxytocin	15	11	4
	Misoprostol	10	3	7
	LSCS for Obstetric Indication	4		4
	<b>Total</b>	<b>29</b>	<b>14</b>	<b>15</b>
a) Delivered within 48 hours of 1 <sup>st</sup> dose of Steroid		21	15	6
<b>Total :</b>	<b>Grand Total::</b>	<b>50 (100%)</b>	<b>29 (58%)</b>	<b>21 (42%)</b>
<b>Conservative Management</b>				
		<b>Vaginal</b>	<b>LSCS</b>	
a) Induced	Oxytocin	09	5	
	Misoprostol	12	4	
	<b>Total</b>	<b>21</b>	<b>9</b>	
b) Spontaneous		29	17	
<b>Total</b>	<b>Grand Total</b>	<b>50 (100%)</b>	<b>26 (52%)</b>	

**Table - 3:** Indication and risk factors for Cesarean Section.

<b>Indication</b>	<b>No. of Cases in Conservative Management</b>	<b>No. of Cases in Active Management</b>
Fetal Distress	5 (20.8%)	9 (45%)
Failure to Progress	5 (20.8%)	4 (20%)
Malpresentation	5 (20.8%)	2 (10%)
Cord Prolapse	3 (12.5%)	1 (5%)
Previous LSCS	3 (12.5%)	2 (10%)
Chorioamnionitis	3 (12.5%)	3 (15%)
<b>Total</b>	<b>24</b>	<b>21</b>
<b>Risk Factors</b>		
Nothing	49	49%
Cervico Vaginal Infection	30	30%
Travel	5	5%
Cervical Surgery	6	6%
Coitus	3	3%
UTI	7	7%
<b>Total</b>	<b>100</b>	<b>100%</b>

Incidence of asphyxiated babies and perinatal mortality was high in active management. Among the 15 cases perinatal deaths 5 were conservatively managed and 10 were actively managed. Out of 31 cases of Asphyxiated babies 14 babies had Respiratory Distress (RD), 10 babies had Septicemia and 4 had Conjunctivitis. Three babies had Umbilical sepsis among which 2 are conservatively managed and 1 actively

managed. Total No. of cases admitted in NICU – 31 (**Figure – 1**).

Among which 11 were conservatively managed and 20 were actively managed. Perinatal mortality was found to be high among those manage actively compared to conservatively managed cases.

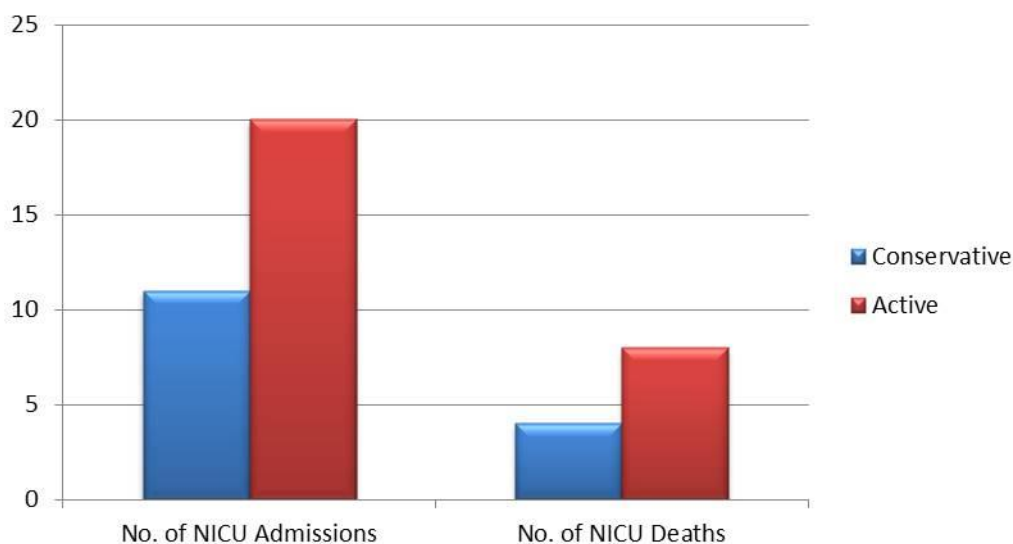
**Table – 4:** Study of Vaginal Flora (n = 50).

Bacterial Flora	No. of Cases	Percentage
<b>Normal Flora</b>	<b>35</b>	<b>70%</b>
Lactobacillus	20	
Doderleins bacilli	10	
Micrococci	5	
<b>Pathogenic Growth</b>	<b>15</b>	<b>30%</b>
E.Coli	9	
Staphylococci	3	
Klebsiella	2	
Stereptococci	1	
<b>Total</b>	<b>100</b>	<b>100%</b>

**Table – 5:** Maternal and Newborn condition in study.

Maternal Condition	Total	Conservative Management	Active Management
Peuperal Pyrexia	12 (100%)	7 (56%)	5 (40%)
Wound Infection	5 (100%)	2 (40%)	3 (60%)
Chorioamnionitis	16 (100%)	10 (62.5%)	6 (37.5%)
<b>Newborn Condition</b>			
Normal	54 (100%)	32 (59%)	22 (41%)
Asphyxiated	31 (100%)	11 (35%)	20 (65%)
Neonatal Death	15 (100%)	5 (33.3 %)	10 (66.6%)

**Figure - 1:** Analysis of NICU Admissions.



## Discussion

PROM is one of the common and challenging obstetrical problem today. Management is one of the most controversial problem and has gone through various cycles of masterly inactivity to immediate delivery. The incidence of PROM varies widely because of the lack of uniformity

in the manner of study. According to the present study incidence of PROM is 10.2% and incidence of PPRM is 2.2%. The incidence of this condition according to DOYLE [4] study is 6-19% and according to Kodanky. BS. Telang study [5] is 6.6%. The difference in the incidence rates in different studies is mainly due to increase



in malpresentations and other risk factors like infection/travel etc. Sita Ram Shrestha study - 6.06% [6].

In the present study incidence is found to be higher in multigravida and maximum between age group 20-25 years similar to study of Kodanky. BS. Telang [5]. Increased in Age and Parity together increased with the incidence of PPRM. Incidence is high in low socio economic status group. Patients who had regular Antenatal checkups had less chance of PPRM.

Incidence of PPRM is more in unbooked cases when compared to booked cases. Many studies have shown that defects in membranes occur because of poor nutritional status which significantly influenced by socio economic status of patient [6].

Vaginal delivery is the commonest mode of delivery in PPRM managed Conservatively (60%) or Actively (52%)—In Kodanky. BS. Telang study the incidence of vaginal delivery is 70% [5].

In the present study 62% PPRM occurred in unbooked cases and 38% in booked cases with risk factors like malpresentation, previous history of preterm labour, travel etc.

Maternal and Fetal prognosis is poor in unbooked cases. Neonatal morbidity and mortality is also high in unbooked cases. Incidence of cesarean section is also high in unbooked cases.

In my study cesarean section rate is increased in cases with conservative management cases compared to active management. The main indication being the fetal distress. Incidence of cesarean section is high in conservatively managed cases compared to actively managed cases. In the present study perinatal mortality is 15% similar to Fernandes GL study [9]. Among the 15% - 33% are conservatively managed and 67% are actively managed cases. Major risk factor per perinatal morbidity and mortality is

respiratory distress. There is also significant increase in neonatal morbidity with increased need for neonatal resuscitation and admission in NICU. Among 17% - 53% are conservatively managed cases and 47% are actively managed cases. Maternal morbidity high in unbooked cases and among mothers belonging to low socio economic status. Administration of antibiotics to status of PPRM decreased the Maternal morbidity similar to study conducted by ACOG [10]. The major perinatal mortality Respiratory Distress Syndrome (RDS).

## **Conclusion**

Preterm premature rupture of membranes is an important cause of perinatal morbidity and mortality, etiology being multifactorial, major cause being Hyaline Membrane Disease (HMD).

Incidence of asphyxiated babies and perinatal mortality is high in active management compared to expectant management of preterm premature rupture of membranes. Incidence of chorioamnionitis is high in patients managed conservatively compared to those with active management. Infections like bacterial vaginosis, urinary tract infections with E.Coli etc., significantly increase the risk of PPRM so administration of antibiotics decreases risk. Screening and effective treatment of these conditions will decrease the incidence of PPRM. PPRM is associated with 30 – 40% of cases of preterm labour. 85% of neonatal morbidity and mortality is due to prematurity. Infectious morbidity can be significantly reduced with antibiotics. Fetal outcome depends on gestational age, lung maturity of the fetus and presence or absence of infection.

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