International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2020; 4(2): 19-23
Received: 10-01-2020
Accepted: 12-02-2020

Charu Mahajan
Assistant Professor, Department of Obstetrics and Gynaecology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

Mariyam Faruqi
Senior Resident, Department of Obstetrics and Gynaecology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

Corresponding Author:
Charu Mahajan
Assistant Professor, Department of Obstetrics and Gynaecology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

Maternal and perinatal outcome in pregnancy complicated by premature rupture of membranes (Prom): A prospective study

Charu Mahajan and Mariyam Faruqi

DOI: https://doi.org/10.33545/gynae.2020.v4.i2a.498

Abstract
Objective: To study the maternal outcome in patients with premature rupture of membranes in view of chorioamnionitis, vaginal/operative delivery, puerperial sepsis & to study the perinatal outcome in patients with premature rupture of membranes in view of septicemia & complications of prematurity
Methods: This is a prospective study of 200 women with PROM from July 2005 to july 2007 done in a hospital in Mysore. The effect of PROM on maternal and perinatal outcome was studied and the results were analysed by employing parameters like mean, standard deviation, chi square test.
Results: The mode of delivery was not statistically significant. Most common cause of maternal morbidity was chorioamnionitis (14.5%). There was no maternal mortality in this study. Perinatal mortality was 4% in the study. Most common cause of perinatal morbidity was septicemia (11.9%), respiratory distress syndrome (10.4%). The organism found in the amniotic fluid culture was polymicrobial.
Conclusion: PROM was associated with high occurrence of maternal morbidity and perintal morbidity and mortality.

Keywords: PROM, chorioamnionitis, sepsis, respiratory distress syndrome, perinatal morbidity

Introduction
Rupture of membranes is normally the last event of the first stage of labor. Premature rupture of membranes is a common clinical entity in the field of obstetrics.
If the membranes rupture anytime during pregnancy labor often sets within 24-48hours Incidence of preterm labor, cord prolapse, chorioamnionitis. So this study was done with the aim to study the maternal outcome in patients with premature rupture of membranes in view of chorioamnionitis, vaginal/operative delivery, puerperial sepsis & to study the perinatal outcome in patients with premature rupture of membranes in view of septicemia & complications of prematurity

Material and methods
It's a prospective study of 200 women with PROM from 1st July 2005 to 1st July 2007 in the Department of Obstetrics & Gynaecology in a hospital in Mysore.

Inclusion
Patients beyond 28 weeks of pregnancy with PROM

Exclusion criteria
All patients presenting with fetal anomalies. A detailed history was taken including age, booking, socioeconomic status, time of onset of rupture of membranes, color, odor of liquor, association with pain or bleeding per vaginum, perception of fetal movements by mother.
A detailed obstetric &menstrual history was taken with special attention to antenatal complications & risk factors and general examination was carried out on all patients falling into the inclusion criteria.
A per speculum examination was done & condition of vagina, cervix and liquor was noted. if no liquor was seen in the vagina, the patient was asked to cough and drainage through vagina was looked for. The sample was collected with sterile pipette & subjected to the following test for confirmation of premature rupture of membranes:

Litmus paper test, fern test, evaporation test. A part of liqour was sent for culture & sensitivity.
A single pelvic examination was done to note the bishops score, adequacy of pelvis, assessment of cephalopelvic disproportion t rule out cord prolapse.

The patients were grouped into 3 groups
Group A: 28-33weeks
Group B: 34-37weeks
Group C: more than 37weeks

Group A: In this group 7 patient were admitted and all were in active phase of labor, so conservative management of PROM was not done. Prophylactic antibiotics were given to all the patients. Steroids were given to all the patients and they were monitored for signs of chorioamnionitis, like maternal tachycardia, uterine tenderness, fever. Immediate nn stress test was done and if it was non reassuring then the patient would be taken up for caesarean section. In other patients ultrasonography was done with focus on fetal biophysical profile. Pelvic examinations were kept to a minimum. During labor if there was any evidence of fetal jeopardy or any medical or obstetrical complications labor was cut short by instrumental delivery or caesarean delivery. In patients with suspicion of puerperal sepsis lochia was sent for culture & sensitivity and appropriate antibiotics were administered. The new born was managed by a neonatologist and babies were followed up for a period of 1 week for late complications.

Group B & C: Patients beyond the gestational age of 34weeks were induced with oxytocin infusion. They were given antibiotics. Labor was monitored with partogram and caesarean delivery was done where indicated. Mother was monitored till puerperium. Baby was followed up for a week to look for any late complications.

Funding: none
Conflict of interest: none

Result
The occurance of PROM in this study was 6.6% 72 patients belonged to the age group below 20years (36%). 84 to 21-25years (42%), 36 cases to the group of 26-30years (17.5%), 9 cases to the group of 31-35 years. (4.5%).

Table 1: Maternal Age in PROM

Age in years	Number	Percent%	Chi square	Pvalue
Below 20	72	36.0	70.92	Less than 0.00
21-25	84	42.0		
26-30	35	17.5		
More than 30	09	04.5		
Total	200	100.0		

Total number of booked cases were equal that is 100 each.

Table 2: Booked/Unbooked cases

	Number	Percent %
Booked	100	50.0
Unbooked	100	50.0

Occurance of premature rupture of membranes at term was 67.5% and preterm was 32.5%.

Table 3: Gestational age in weeks

Gestational age	Number	Percent%	Chi square	P value
28-33weeks	7	3.5	124.57	Less than 0.00
34-37weeks	58	29.0		
More than 37 weeks	135	67.5		
Total	200	100.0		

Out of 200 patients 138 (69%) were primigravidas and the rest (31%) were multigravida. They were further divided into gestational ages accordingly.

Table 4: Relationship of parity with gestational age

Parity	28-33		34-37		More Than 37		Total		P-Value
	Number	%	Number	%	Number	%	Number	%	
Primigravida	6	85.7	35	60.3	97	71.9	138	69	0.177
Multigravida	1	14.3	23	39.7	38	28.1	62	31	
Total	7		58		135		200	100	

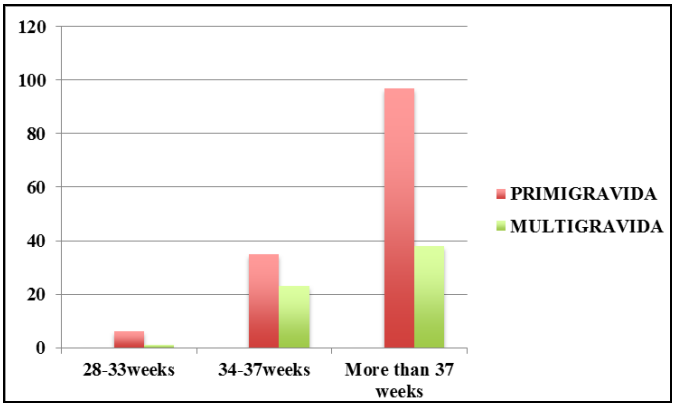

Fig 1: Parity with gestational age

This consists of the time between the onset of PROM and admission of the patients to the hospital before the onset of labor pains. 101 patients had a PROM admission time below 6hrs, 68 patients had 7-12hrs, 22 patients had 13-24hrs and 9 had more than 24hrs.

Table 5: PROM admission interval

Duration in Hours	Number	Percent %	Chi square	P value
Below 6	101	50.5	107.800	Less than 0.00
7-12	68	34.0		
13-24	22	11.0		
More Than 24	09	04.5		
Total	200	100		

Steroids were not given to all the preterm patients. All patients with gestational age less than 34weekand those whose gestational age was doubtful and were preterm were given steroids.

Table 6: Relationship with steroid coverage

Steroids	Number	Percent%	Chi square	P value
yes	27	13.5	106.580	Less than 0.00
no	173	86.5		

165 patients had sterile amniotic fluid. It was found that chorioamnionitis which occurred was polymicrobial.

Table 7: Microorganisms in amniotic fluid culture

Organism	Number	Percent	Chi square	P value
Sterile	165	82.5	905.840	Less than 0.00
Streptococcus	6	3		
Staph aureus	6	3		
E. coli	19	9.5		
E. coli with Staph aureus	1	0.5		
E. coli with Klebsiella	1	0.5		
Proteus	1	0.5		
Klebsiella with Mycoplasma	1	0.5		
Total	200	100		

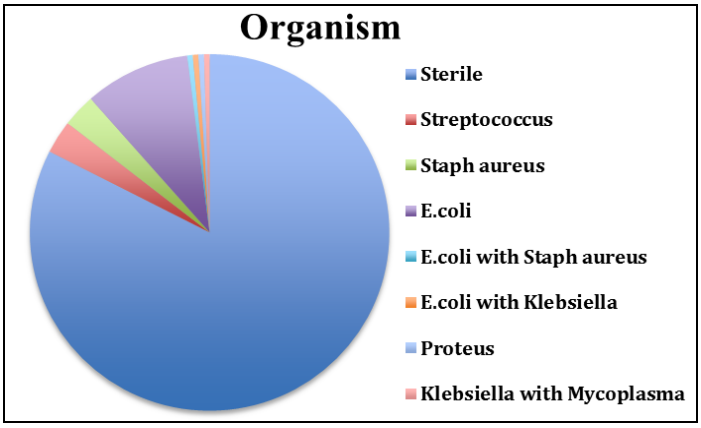

Fig 2: Microorganisms in amniotic fluid culture

Latent period was defined as the interval between the occurrence of PROM and onset of labor. The findings are mentioned in the table below.

Table 8: Relationship of latent period with PROM

Latent Period	Number	Percent	Chi Square	P Value
Less Than 6 Hours	84	84.2	47.139	Less Than 0.00
More Than 6 Hours	15.	15.8		
Total	99	100		

The duration of 1st stage of labor ranged from 60 to 720 minutes with a mean of 311.5minutes. This shows that the first stage of labor was prolonged. The duration of 2nd stage of labor ranged from 01 to 45 minutes with a mean of 15.96 minutes. The duration of 3rd stage of labor ranged from 5 to 15 minutes with a mean of 8minutes. This shows that the 2nd and 3rd stage of labor wa not affected.

Table 9: Distribution of stages of labor in patients having vaginal delivery

Stage	Minimum	Maximum	Mean (Min)	Standard Deviation
1st Stage	60	720	311.515	168.54
2nd Stage	01	45	15.96	8.25
3rd Stage	5	15	8.15	3.38

Table10: Distribution of PROM to delivery interval

Duration in Hours	Number	Percent%	Chi square	P value
Below 6	33	16.5	49.04	Less than 0.00
7-12	79	39.5		
13-24	69	34.5		
More Than 24	19	09.5		
Total	200	100		

Mode of delivery: operative deliveries outnumbered normal delivery in cases of PROM.

Table11: Mode of delivery

Mode of Delivery	Number	Percent %
Preterm Vaginal	25	12.5
Term Vaginal	63	31.5
Instrumental	10	5
Assisted Breech	1	0.5
Vbac	1	0.5
Lscs	100	50

The following table shows the indications for LSCS in cases of PROM

Table 12: Indication of LSCS

Indication	Number	Percent%	Chi Square	P Value
Contracted Pelvis	12	12	320.48	Less Than 0.00
Cephalopelvic Disproportion	13	13		
Fetal Distress	47	47		
Breech	7	7		
Transverse Lie	2	2		
Face	1	1		
Oblique Lie	5	5		
Placenta Previa	1	1		
Low Bpp	1	1		
Anhydramnios	1	1		
Obstructed Labor	1	1		
Deflexed Head	1	1		
Cervical Dystocia	4	4		
Failure To Progress	2	2		
Previous 2 Lscs	1	1		
Brow	1	1		
Total	100	100		

The following table shows the relationship between PROM & APGAR score at 1 minute.

Table 13: APGAR score at 1minute

Apgar	Number	Percent	Chi Square	P Value
Less Than 5	28	14	881.36	Less Than 0.00
More Than 5	172	86		

The following table shows the occurrence of maternal morbidity in relation to PROM delivery interval

Table 14: Maternal morbidity

Maternal condition	Less than 6 hr	7-12 hr	13-24hr	More than 24 hr	total	percent	P value
Normal	31	67	53	5	150	78%	Less than 0.00
Chorioamnionitis	2	4	12	11	29	14.5%	
Wound gaping	-	1	-	1	2	1%	
Anemia	-	5	1	1	7	3.5%	
Episiotomy infection	-	2	1	1	4	2%	
PPH	-	-	1	-	1	0.5%	
Endometritis	-	-	1	-	1	0.5%	
Total	33	79	69	19	200	100%	

The following table shows the occurrence of maternal morbidity in relation to PROM delivery interval.

Table 15: Perinatal morbidity with PROM delivery interval

Morbidity	Below 6 hrs	6-12hrs	13-24hrs	More than 24hrs	Total	Percent
Normal	23	54	32	5	114	61.9
Birth Asphyxia	3	6	6	1	16	8.3
Septicemia	-	4	12	7	23	11.9
IUGR	1	2	1	-	4	2.1
MAS	3	1	3	-	7	3.6
NEC	-	1	-	-	1	0.5%
RDS	3	7	7	3	20	10.4
Cord sepsis	-	-	1	-	1	0.5
Bronchopneumonia	-	-	2	1	3	1.6
Ophthalmia neonatorum	-	-	3	-	3	2.1
Total	33	75	67	17	192	100

Out of 200 patients, 8 patients died in the perinatal period due to various causes. The patients with congenital anomalous fetuses were not included in the study. Two cases died due to birth asphyxia, 1 died of meconium aspiration syndrome, 1 baby had a stillbirth, 1 had hyaline membrane disease, 2 died of NEC and 1 died on intraventricular haemorrhage. Thus, perinatal mortality rate was 4% in the study.

Discussion

There were 3020 deliveries in the study period and the number of patients with premature rupture of membranes who fulfilled the inclusion criteria were 200. The incidence of PROM in this study is 6.6% Merenstein [1] *et al.* have quoted the incidence of PROM as 2-18% Wennstrom [2] *et al.* quoted the incidence as 4-18%. The mean age of presentation in the present study was 22.3years. According to James M Alexander [3] *et al.* the mean age of presentation was 25years Irina A Buhimschi [4] *et al.* quoted the mean age of presentation to be 27.3years while Chaudhari Snehamay [5] quoted it to be 23.2 years which is comparable to the present study.

The mean gestational age of presentation in patients of PROM in this studyis 37.6 weeks of gestation.

According to the study by Chaudhari Snehamay *et al.* the mean gestational age was 38.7weeks while Irina A Buhimuschi found it to be 38.5weeks both of which are comparable to the present study. In the present study 69% cases were primigravida & 31% cases were multigravida. The distribution is similar to that of Chaudhari Snehamay *et al*., George Susan Shanti [6] *et al.* & Shetty [7] *et al*. according to which primigravida were 75.6%, 74.7% 66.7% & multigravida were 24.3%, 25.3%, 33.3% respectively.

The mean duration between PROM admissions was 22hours whereas according to Fabiana da Garca Krupa [8] *et al*. the mean duration was 6hours. This disparity was due to presence of two patients with PROM admission interval of 15days & 4days.

Beta hemolytic streptococcus are the organism studied mostly. In the present study beta hemolytic streptococci were found in 3% cases which are comparable to the study by Chaudhari Snehamay *et al*. which is 8%.

The mean PROM delivery interval in the current study was 22hours, which was similar to study by Anna Locatelli [9]. In the present study LSCS accounted for 50% of the cases, preterm vaginal delivery 12.5% term vaginal delivery 31.5%, instrumental vaginal delivery 5% which was comparable with the study by Anna Locatelli. In the present study fetal distress accounts for 47% of indications of caesarean section, CPD accounts for 13% and cervical dystocia accounts for 4%. Similar results were seen in the study done by Fabiana da Garca Krupa.

The mean birth weight in the present study was 2.52kg which was similar to the study conducted by Jong Kwan Jun *et al*. [10]. In the present study the mean APGA at 1min is 6.6, which was similar to the APGAR obtained by Chaudhari Snehamay *et al*.

In the present study the incidence of chorioamnionitis is 14.5%, comparable with the study by Thomas M Jenkins [11] *et al*.

In the present study the incidence of endometritis is 0.5%. Whereas according to Stephen T Vermillion [12] *et al*. the incidence is 4.3%. the reduced incidence in this study could be due to administration of prophylactic antibiotics to all patients.

In the present study the incidence of wound infection was 0.5% according to James M Alexander *et al*. the incidence of wound infection is the same ie 0.5%.

In the present study the incidence of perinatal mortality is 4% which is in accordance with the study by Stephen T Vermillion *et al*. In the present study the incidence of RDS is 10.4% which is comparable to that quoted by Jong Kwan Jun *et al*. In the present study the incidence of NEC was 0.5% in comparison to that by Jong Kwan Jun *et al* which was 2%. In the present study the incidence neonatal sepsis is 11.9%, which is similar to James M Alexander *et al*. In the present study the incidence MAS is 3.6%, comparable to the results obtained by Fabiana da Graca Krupa.

Conclusion

To conclude it was seen that premature rupture of membranes was associated with a high occurence of maternal morbidity and perinatal mortality &morbidity. The main causes for these have been found to be infection and prematurity.

The etiology of infection seems to be polymicrobial &prophylactic antibiotics should be advocated. During labor 1st stage is prolonged without any significant change in 2nd & 3rd stage of labor. The tion has also been found to be caesarean sec occurrence of increased. More number of complications are seen if the PROM delivery intervalis prolong and if premature rupture of membranes occurs remote from term.

The management of these patients should be individualised keeping a balance between chorioamnionitis and prematurity. A good neonatal intensive care unit is instrumental in reducing the perinatal morbidity & mortality.

References

1. Merenstein GB, Weisman LE. Premature rupture of the membranes Neonatal consequences. Semin Perinatol. 1996; 20(5):375-380. [PubMed] [Google Scholar]
2. Gahl WA, Kozina TS, Fuhrmann DD *et al*. Diamine oxidase in the diagnosis of ruptured fetal membranes. Am J Obstet Gyanecol. 1982; 60:297-99.
3. Alexander JM, Bloom SL, McIntire DD, Leveno KJ. Severe preeclampsia and the very low birth weight infant: is

induction of labour harmful? Obstet Gynecol. 1999; 93:485-8.
4. Irina Buhimschi A, Rob Christnet, Catalin Buhimschi S. Proteonomic bio marher analysis of amniotic fluid for identification of intra amniotic inflammation. BJOG. 2005; 112:173-181.
5. Chaudhari Snehamay, Mita Sankar Nath, Biswas Pranab Kumar *et al*. premature rupture of membranes at term-immediate induction with PGE2gel compared with delayed induction with oxytocin. J Obstet gynaecol India. 2006; 56(3):224-29.
6. George Susan Shanti VS, Gangarani Seshadri Lakshmi *et al*. term PROM-a twelve-hour expectant management. J Obstet gynaecol India. 2003; 53(3):230-33.
7. Shetty A, Danielian P, Templeton A. A comparison of oral and vaginal misoprostol tablets in the induction of labour at term. Br J Obstet Gynaecol. 2001; 108:238- 243.
8. Krupa GF, Cecatti F, Guilherme J *et al*. Misoprostol versus expectant management in premature rupture of membranes at term. BJOG. 2005; 112:1284-90.
9. Anna Locatelli, Patrizia Vergani, Gabriella Di Pirro- role of amnioinfusion in the management of PROM less than 26weeks gestation. Am J Obstet Gyanecol. 2002; 183:878-82.
10. Jong Kwan Jun, Bo Hyun Yoon, Roberto Romero*et al* interleukin 6 determination in cervical fluid have diagnostic and prognostic value in PPROM. Am J Obstet Gyanecol. 2000; 183:847-52.
11. Thomas M Jenkins, Vincenzo Berghella, Phillip A Shlossman *Et al*. Timing of Cerclage Removal after Preterm Premature Rupture of Membranes. Am J Obstet Gyanecol. 2000; 182:868-73.
12. Vermillion, Stephen Kooba, Austin Soper, David. Amniotic fluid index values after preterm premature rupture of the membranes and subsequent perinatal infection. American journal of obstetrics and gynecology. 2000; 183:271-6. 10.1067/mob.2000.107653.