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STUDY OF MATERNAL AND PERINATAL OUTCOME IN CASES OF PRETERM PREMATURE RUPTURE OF MEMBRANES

Gynaecology

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ABSTRACT

Background: Preterm premature rupture of membranes (PPROM) occurs in 3%to6% of pregnancies and is responsible for approximately one third of all preterm births.
Aims & Objective: of present study was to analyse the maternal and perinatal outcome of PPROM patients between 28 to 36 weeks +6days admitted in labour room of obs and gynae dept. of DMCH from January 2019 to April 2020.
Material and Methods: It is hospital based prospective observational study of 100 patients of preterm premature rupture of membranes in between 28-36 weeks+6 days gestation with singleton pregnancy admitted in our tertiary care centre (Department of Obstetrics and Gynaecology, DMCH, Laheriasarai, Bihar).
Results: In this study 42% patients went into spontaneous labour and 58% needed induction or augmentation. 68% patients had vaginal delivery and 23% required LSCS. The main indications for LSCS being malpresentation (26%) followed by foetal distress (22%). There was no maternal mortality; morbidity was found in 15% patients.
Perinatal morbidity was seen in 40% and was mainly due to RDS, sepsis andhyperbilirubinaemia . Perinatal mortality was seen in 17% and was due to sepsis in 29.4%, RDS in 52.94% and birth asphyxia in 17.6%.
Conclusion: PPROM is one of the important causes of preterm birth that can result in high perinatal morbidity & mortality along with maternal morbidity. Looking after a premature infant puts immense burden on the family, economy and health care resources of the country. Therefore management of PPROM requires accurate diagnosis and evaluation of the risks and benefits of continued pregnancy or expeditious delivery. An understanding of gestational age dependent neonatal morbidity and mortality is important in determining the potential benefits of conservative management of preterm PROM at any gestation.

KEYWORDS

INTRODUCTION

Preterm premature rupture of membranes (PPROM) occurs in 3%to 6% of pregnancies and is responsible for approximately one third of all preterm births (Bartfield 1998; Goldenberg 1998).1,2 The incidence of preterm premature rupture of membrane averages from 0.7 to 2.1% and accounts for about 20 to 40% cases of PROM before 37 weeks of gestation. Jayaram et al analysed 100patients with PROM between 32-40 weeks, and found the incidence of PROM to be 7.71% (69% term and 31% PPROM).3 Although preterm premature rupture of membrane complicates about 2-4% of singleton pregnancies and 7-20% of twin pregnancies, it is associated with 60% preterm deliveries and 10% of perinatal death. Preterm PROM is an important cause of perinatal morbidity andmortality, particularly because it is associated with brief latency from membrane rupture to delivery, perinatal infection, and umbilical cord compression due to oligohydramnios. Preterm premature rupture of membranes is defined as spontaneous rupture of amniotic membranes before the onset of uterine contractions or prior to the onset of labour after the age of viability and before 37 completed weeks (36weeks+6days). Latency period is the time interval between the rupture of the membranes and the onset of uterine contractions. Kappy and Khupel defined PROM as rupture of the membranes with atleast 2 hours of latent period before active labour.4 The membranes may either rupture at term (>37 weeks) when it is called term PROM or before 37 weeks of gestation when it is refered to as preterm PROM (PPROM). PPROM is associated with increased risk of chorioamnionitis, unfavourable cervix, dysfunctional labour, increase in caesarean rates, postpartum hemorrhage and endometritis in mother. In fetus increased occurrence of hyaline membrane disease, intraventricular hemorrhage, sepsis, cord prolapse, fetal distress and increased fetal wastage. The longer the time interval between the rupture of membranes and onset of labour, greater is the risk of ascending infections and chorioamnionitis. This risk may assume grave proportions in patient undergoing ceaserean section. Thus, earlier the gestational age at the time of PPROM, longer the latency and more the complications. In planning the management of PPPROM, several issues need to be considered. Prematurity is the principal risk to the fetus while infectious morbidity is the primary maternal risk. Chorioamnionitis with PPROM is responsible for significant maternal and neonatal morbidity including early onset neonatal sepsis, bronchopulmonary dysplasia, intraventricular haemorrhage and periventricular white matter injury. PPROM is an obstetric conundrum with significant maternal morbidity and neonatal morbidity and mortality, a careful consideration of various factors and individualization of cases is necessary for appropriate management.

AIMS AND OBJECTIVES

Objective of present work was to study the maternal and perinatal outcome in women admitted with preterm premature rupture of membranes (PPROM), between 28weeks and 36weeks+6days, in labour room of Obstetrics and Gynecology Department, in Darbhanga Medical College&Hospital ,Laheriasarai from jan2019-april2020.

MATERIAL AND METHODS

Present Hospital based prospective observational study was conducted at Department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar from Jan 2019 to april 2020. 100 patients of preterm premature rupture of membranes in between 28-36 weeks+6days gestation admitted in labour room, were studied after considering inclusion and exclusion criteria.

INCLUSION CRITERIA

All pregnant women with a singleton pregnancy between 28-36week+6days ofgestational age with preterm prematurerupture of membranes.

EXCLUSION CRITERIA

1. Multiple pregnancies
2. Intrauterine growth restriction
3. Uterine anomalies
4. Foetal anomalies
5. Myoma uteri
6. Hypertensive disorders and pregnancyinduced hypertension
7. Gestational diabetes
8. Antepartum haemorrhage

9. Chronic renal failure
10. Class II to IV cardiac diseases.

Method of collection of data

A detailed history was taken including age, booking, socio-economic status, time of onset of draining, amount of fluid lost, its colour, odour, association with pain or bleeding per vagina and perception of foetal movements.

General examination was done, Height and weight were noted. Systemic examination included cardiovascular, respiratory systems and CNS systems.

In the obstetric examination, following were l noted. Height of uterine fundus, lie, presentation and position of foetus, engagement of presenting part, condition of ut e ruswhe the r contracted or relaxed. Uterine tenderness was looked for as a sign of chorioamnionitis. Foetal heart sound was auscultated and its rate, rhythm l and tone were noted. A sterile speculum examination was done and amniotic fluid pooling in posterior fornix was observed.The colour and smell of fluid was noted. If no fluid was seen, the patient was asked to cough and drainage of fluid was looked for. In doubt, vaginal fluid specimen was collected and subjected to litmus paper test.Cervical swab was taken and sent for l Gram stain and culture sensitivity.

A single pelvic examination was done to note the Bishop's score, adequacy of pelvis, assessment of CPD and to rule out cord prolapse.

Investigations like total count, differential count and C-reactive protein were done. Prophylactic antibiotic in the form of injection ampicillin 1gm IV every 6hrly

Conservative management was done in all early PPROM (28weeks to 33weeeks+6days) patients till the onset of spontaneous labour or till the maternal or fetal indication for delivery ensues such as chorioamnionitis, meconium stained amniotic fluid, abruption, cord prolapse, fetal distress and/or advanced labour on admission. All late PPROM (>34weeks) patients were induced if not getting into spontaneous labour. Patients were hospitalized until delivery & were advised bed rest. Two doses of betamethasone 12 mg I.M 12 hours apart were given to the mothers

Table 1: Analysis of PPROM cases according to maternal age.

Age in years	No. of cases	Percentage
<20	10	10
20-29	76	76
>30	14	14

From the above Table it can be observed that highest number of PPROM cases were in the Age group of 20-29 years.

In this study PPROM was present in 76% of cases in the age group of 20-29 years this is comparable with the study conducted by Okeye13 et al (58.2%).

The age of the general population delivering in this Institute in the age group of 20-29 years was 74.5%. This may be the reason for preponderance of cases in this age group.

Table 2: Analysis of PPROM according to socio-economic status.

Socio-economic status	No. of cases	Percentage
Upper	4	4
Middle	31	31
Lower	65	65

In this study the patients of low socioeconomic status were 65% and middle socioeconomic status were 31% which is comparable with the study by Swathi Pandey[3] which is 61% and 39% respectively.

Studies have shown that defects in the amniotic membranes occur due to low socio-economic status associated with factors like malnutrition, over exertion, poor hygiene, stress, high parity, recurrent genitourinary infection and anaemia. The risk of PPROM increases with decrease antibacterial activity in the amniotic fluid of patients with low socio-economic status.

Table 3 Analysis of PPROM according to obstetric score (Parity).

Parity	No. of cases	Percentage
Primigravida	45	45
Multigravida	55	55

No. of primigravida in the study were 45% and multigravida were 55%.

Multiparity is a risk factor for PPROM due to long standing infection, previous trauma to cervix and patulous os.

In this study multipara were 55% and primipara were 45% which is comparable to the study by Swathi Pandey[3] (multipara 48% and primipara 52%) and Fatemeh Tavassoli, Iran (primipara 55.9% and multipara 44.1%).

Table 4 : Analysis Of Pprom According To Mode Of Delivery.

Mode of delivery	No. of cases	Percentage
Spontaneous labour	42	42
Induction of labour	14	14
Augmentation of labour	29	29
Induction and augmentation	15	15

Spontaneous vaginal deliveries were in 42% of the cases and induction or augmentation or both were done in 58% of the cases.

PPROM is usually followed by labour. The onset of labour after PPROM is directly related to the gestational age at the time of rupture. In this study 42% developed spontaneous labour and 58% needed induction or augmentation. Our study is also comparable to that of Kadikar et al where 79.19% of the patients required Induction.

In this study normal vaginal delivery in primigravida was 47% and multigravida 53%, outlet forceps were 44.45% in primigravida and 55.56% in multigravida. but LSCS were 56.52% in multigravida and 43.48% in primigravida. The mode of delivery according to parity did not show any significant difference in the ND and outlet forceps groups but LSCS were more in the multipara than in the primipara. There was no statistical significance in these groups.

In this study induction/ augmentation was done in 58 cases of which 72.41% of the cases delivered within 12 hours, 19% delivered in 24 hours and 8.61% delivered after 24 hours. According to studies by Maternal foetal medicine network[11] induction has several benefits including a shorter time to delivery (14 vs 36 hours), shorter maternal hospital stay and less chorioamnionitis. Neonatal hospital stay was also shorter and hence neonatal sepsis in the induction group was less (28 vs 60%). There was no difference in the rates of LSCS, postpartum infection and neonatal survival.

Table 5 Analysis Of Cases According To Pprom To Delivery Interval

Pprom in hours	No of cases	percentage
<12	28	28
13-24	20	20
25-36	25	25
>36	27	27

Duration of PPROM is inversely related to gestational age when the membranes ruptured.[17] Many studies have shown that earlier in gestation (23-28 weeks), 30-40% of pregnancy will advance more than 1 week after PPROM. 20% will advance for more than 4 weeks. On the other hand later in gestation (32-34 weeks) fewer women will deliver after 1 week and 40% will deliver within 3 days.

The main indication for LSCS was mal-presentation and foetal distress.In this study LSCS was done in 23% of the cases, the main indications being malpresentation 26% followed by foetal distress 22%,it is comparable to the study by Kamala Jayaram,4 the indications being failed induction, foetal distress and malpresentation.

Cervical swab positive in 20% of the cases. Organisms isolated were E.coli, Klebsiella, Group B streptococcus, staphylococcus aureus, coagulase negative staphylococcus,coagulase positive staphylococcus and candida species.

The investigations like total count, C-reactive protein and high vaginal swab for culture and sensitivity were done to evaluate for the evidence of infection. Leucocytosis can be affected by pregnancy and labour.

CRP estimates seem to be reliable monitoring tool. But in more detailed studies WBC and CRP were poor predictors of the presence of a positive amniotic fluid or foetal blood culture.

The commonest organisms isolated by Swathi Pandey in cervical swab was E . coli and by Kamala JayaramE.coli, staphylococci, streptococci and atypical coliforms. In this study the organisms isolated were E.coli, coagulase positive staphylococcus, providential organisms, candida and normal vaginal flora.

25% of the cases underwent LSCS when AFI was < 5.

The findings of this study correlate with the studies by Hoskins and Sedigheh Borna. Both concluded that oligohydramnios had an increased operative deliveries for foetal distress. These patients with reduced AFI on NST had spontaneous deceleration. These studies suggest that NST could be used to monitor for low AFI and cord compression in patients with PPROM.

In present study 80% maternal morbidity when duration of PROM exceeded 24 hours.

No maternal mortality was seen.

Table 6 :analysis of maternal morbidity in PPROM according to its causes

Morbidity	No.	Percentage
Febrile morbidity	10	10
Wound infection	1	1
LRTI	1	1
MROP	1	2
PPH	2	

As the duration of PPROM increases the maternal morbidity also increases.

In this study 85% of patients werehealthy and febrile morbidity was seen in10 % of cases.

The most common complication of prematurity was hyperbilirubinemia followed by RDS and sepsis. The study conducted by Arul Kumar[7] showed that after 32 weeks of gestation the common causes of perinatal morbidity were RDS, perinatal asphyxia and infection, but with good supportive neonatal care most of the infants can survive.

Table 7:Analysis of PPROM and Perinatal morbidity

Causes	No of cases
Hyperbilirubinemia	24
RDS	22
NEC	2
ROP	1
IVH	1
Sepsis	11
Birth asphyxia	2

In this study perinatal morbidity was 40% of which most common cause is hyperbilirubinemia followed by sepsis and RDS.Kadikar 2014 found 61% and Kamala Jayaram 24% perinatal morbidity.

Table 8 : Analysis of pprom according to perinatal mortality

Causes	No of cases	percentage
RDS	9	52.94%
Sepsis	5	29.41%
Birth asphyxia	3	17.64%

In this study, perinatal mortality was 17% of which 29.4% were due to sepsis, 52.94% were due to RDS and 17.64%were due to birth asphyxia.

The high incidence of maternal and neonatal infection may be consequence of decreased antibacterial activity in the amniotic fluid which is low in early pregnancy and increases with gestational age. Another factor is the limited ability of a preterm infant to fight infection.

As the duration of PPROM increases, perinatal morbidity and mortality also increases. Perinatal morbidity was 51.54% and perinatal mortality was 52.94% with PPROM to delivery interval more than 36 hours.

The studies by Russel[19] showed that the danger of infection to both mother and foetus increases with duration of PPROM. But prolongation of latent period decreases the incidence of RDS.

In this study RDS occur in 52.94% of the cases which is comparable to the studies by Richardson. RDS was present in 64% of the cases, when the gestational age was less than 32 weeks and duration of PPROM was < 24 hours and 32% when gestational age was 30 weeks and duration of PPROM was > 24 hours.

According to Yoon RDS occurred in24.6% when PPROM was < 24 hours and12.5% when PPROM was > 24 hours.

In this study perinatal mortality was highest - 64.70 % when the birth weight was upto 1000 gms. As the weight increases perinatal morbidity and mortality decreases. When the weight was more than 2000 gms there were no mortalities.

CONCLUSION

In this study the prevalence of PPROM in our institute was comparable to that of other studies. The mode of delivery in PPROM was not different from that of general population delivering in our institute. Rate of caesarean section was not high and indications being foetal distress from oligohydramnios and malpresentation. The maternal morbidity, perinatal morbidity and mortality increases as the duration of PPROM increases. Also perinatal morbidity and mortality were high in very premature babies and infants with low birth weight. As the weight increases the morbidity and mortality decreases.

PPROM is a significant obstetric problem. Despite exhaustive research most of the aspect of PPROM remain enigmatic. It contributes to increased maternal morbidity as well as perinatal morbidity and mortality. Careful antenatal monitoring, detection and prompt treatment of infection is necessary. Strict aseptic precautions, appropriate therapy, regular antenatal follow-up are important factors in the prevention and management of PPROM.

We feel that recent measures like CRP, band neutrophil count and therapeutic use of specific human gamma globulin against vaginal flora as well as preventive measures like coital abstinence will definitely help to reduce the morbidity and mortality.

These patients are at a high risk for infection and amniocentesis can be used to evaluate early markers for infection and provide a sample of amniotic fluid for culture. Any evidence of infection by amniocentesis should be considered carefully as an indication for delivery.

Close antenatal monitoring, identification of risk factors like cervico-vaginal infection and their management play an important role in the prevention of PPROM.

From this study we arrive at the conclusion that management should not be a generalised regime. Multi factorial study of individual cases and management has to be planned accordingly, varying from expectant to aggressive therapy. Danger of infection to both mother and foetus increases with increased duration of PPROM.

Our experience to date from available sources suggest that management of PPROM still requires critical study.

REFERENCES

1. ACOG Committee on Practice Bulletins - Obstetrics, authors. Clinical Management guidelines for Obstetrician-Gynecologists. (ACOG Practice Bulletin No 80: premature rupture of membranes). *ObstetGynecol* 2007; 109: 1007-1019.
2. Anjana Devi, Reddi Rani. Premature rupture of membranes - A clinical study. *Journal of Obstet and Gynaecol of India* 1996; 46-63.
3. Arul Kumaran, Leonie K Penna et al. prelabor ROM Management of labor, Orient Longman 2005; 306-318.
4. Carroll SG, Philpott-Howard J, Nicolaides KH. Amniotic fluid Gram stain and leukocyte count in the prediction of intrauterine infection in pre labouramniorrhexis. *Fetal Diagn Ther* 1996; 11: 1-5.
5. Caughey AB, Robinson JN, Norwitz ER. Contemporary Diagnosis and Management of Preterm Premature Rupture of Membranes. Rev. *ObstetGynecol* 2008; 1(1): 11-22. PMCID: PMI2492588
6. Dr. Gunavant et al A Study of Feto-Maternal Outcome in Cases of Premature Rupture Of Membrane. *IJSR* March 2014; 3(3): 299-301.
7. Fernando Arias; Premature rupture of the membrane, "Practical guide to high risk pregnancy and delivery". 3rd Edition; Elsevier, New Delhi, 2008; 220-237.
8. Mercer BM, Arheart KL. Antimicrobial therapy in the expectant management of PPROM. *Lancet* 1995; 346: 1271-79.
9. Mercer BM, Goldenberg RL, Meis PJ, et al. The NICHD Maternal -Fetal Medicine Units Network, The Preterm Prediction study: prediction of preterm premature rupture of membranes through clinical findings and ancilliary testing. *Am J ObstetGynecol* 2000; 183: 738-745.
10. Mercer BM, Rabello YA, Thurnau GR, Miodovnik M, Goldenberg RL, Das A et al. The

NICHD-MFMU antibiotic treatment of preterm PROM study: Impact of initial amniotic fluid volume on pregnancy outcome. *Am J ObstetGynecol* 2006; 194: 438 - 45.
11. Okeke TC, Enwereji JO, Okoro OS, Adiri CO, Ezugwu EC, and Agu PU, et al. The Incidence and Management Outcome of Preterm Premature Rupture of Membranes in a Tertiary Hospital in Nigeria. *American Journal of Clinical Medicine Research* 2014;1: 14-17. doi: 10.12691/ ajcmr-2-1-4.
12. Pandey Swati, Dave et al, Maternal and fetal outcome in cases of preterm premature rupture of membranes. *Journal of obstetrics and Gynaecology of India.* 2000; 50-63.
13. Russell KP, Anderson G et al. Aggressive management ruptured membranes. *Am J ObstetGynecol* 1962; 83: 930-1962.
14. Shehla Noor et al. Foetomaternal outcome in patients with or without premature rupture of membrane. *J Ayub Med Coll Adottabad* 2010; (1): 22.
15. Singhal P, Singhal AK. Fetomaternal outcome in premature rupture of membranes. *Obs& Gynae Today* 2002; 10: 585.
16. Tavassoli F, et al. Survey of pregnancy outcome in preterm premature rupture of membrane in AFI < 5 and > 5. *OMJ* 2010; 25: 118-123 doi:10.5001/omj.2010.32
17. TrinitiA et al. Epidemiologic study of cervical swab culture in preterm premature rupture of membrane at Ramathibodi Hospital. *Thai Journal of Obstetrics and Gynaecology* July2008; 16: 17861-67.
18. V. Kamala Jayaram, Scaila Sudha, A study of premature rupture of membranes-Management and outcome. *Journal of Obstetrics and Gynaecology of India* 2001; 51(2): 58-60.
19. Yoon BH, Jun JK, Park KH, e t a l . Serum C-reactive protein, while blood cell count, and amniotic fluid white blood cell count in women with preterm premature rupture of membranes. *ObstetGynecol* 1996; 88: 1034-40.