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Original Research Article

A study of fetal outcome in patients with premature rupture of membranes with gestational age more than 28 weeks

Shantanu H. Rajmane*, Mamta Anand, J. B. Senapati

Department of Obstetrics and Gynecology, Rajiv Gandhi Medical College, Thane, Maharashtra, India

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***Correspondence:**
Dr. Shantanu H. Rajmane,
E-mail: rajmaneshantanu@gmail.com

ABSTRACT

Background: Premature rupture of membranes is rupture of membranes before the onset of labour irrespective of gestational age. If it occurs before 37 weeks, it is called as preterm premature rupture of membranes (PPROM). Once PROM delivery is inevitable, so neonatal prognosis depends on gestational age at which PROM occurs. Neonatal complications include prematurity and its complications mainly, also pulmonary hypoplasia due to severe oligohydramnios, skeletal and joint deformities to foetus due to compression, increased risk of neurodevelopmental impairment and neonatal white matter damage. PROM is a still one of the most difficult and controversial problems in obstetrics.
Methods: A prospective longitudinal study was conducted in Department of Obstetrics and Gynaecology at a tertiary care hospital from 2021 to 2023 (18 months). A total of 275 patients admitted with complaints of per vaginal leaking with gestational age more than 28 weeks were studied. A multivariate analysis was used to find association between PROM and foetal outcome.
Results: In this study, 57% (157) new-borns had birth weight >2.5 kgs, 60% (166) new-borns had APGAR score 8/10, 71% (196) new-borns were term, 40% (109) had NICU stay, 6% (17) had respiratory distress syndrome (RDS), 3% (8) had neonatal sepsis, 2% (6) had neonatal hypoglycaemia and perinatal mortality rate was 1% (3).
Conclusions: Once there is PROM, delivery is imminent. Neonatal outcome can be improved significantly after administration of steroids and antibiotics. To get that time short term tocolysis can be used. During that time foeto-maternal monitoring should be done for early detection of chorioamnionitis. Looking after preterm infants puts an immense pressure on family, economy and health care resources. The prevention of PROM is difficult so more focus should be on management of PROM.

Keywords: Foetal outcome, Per vaginal leaking, Premature rupture of membranes

INTRODUCTION

Rupture of membranes before the onset of contractions or in the absence of contractions is called as premature rupture of membranes (PROM).[1] If membranes rupture before 37 weeks, it is known as preterm premature rupture of membranes (PPROM).[2] It is commonly seen in multigravidas & at the end third trimester.[3] Incidence of PROM in developing countries like India varies from 7% to 10%.[4] Complications of PROM is seen in 3% cases. [4] When membranes rupture for >24 hours, it is called as Prolonged PROM.[5]

Premature rupture of membranes occurs from multifactorial causes that ultimately results in accelerated membrane weakening due to an increase in local cytokines and an imbalance between MMPs and TIMPs, increased

protease activity, increased collagenase activity and factors that results in increased intrauterine pressure.[6]

Most common etiological factor associated with PROM is subclinical urinary tract infection (UTI).[3] Clinical factors associated with preterm PROM include low socioeconomic status, low body mass index, tobacco use, preterm labour history, urinary tract infection, vaginal bleeding at any time in pregnancy, cerclage, and amniocentesis.[7] Risk of complications of PROM is more in individuals having low body mass index, concomitant infection of the gestational tissues, previous h/o of PROM, longer interval between PROM and delivery.[8]

Most common complication of PROM is preterm delivery.[9] Preterm delivery results in birth of neonate who is preterm and it's complications mainly, pulmonary hypoplasia, skeletal deformities and joint deformities due to compression, increased risk of neurodevelopmental impairment and neonatal white matter damage.[10]

The successful outcome in cases of PROM depends on multidisciplinary approach, meticulous monitoring, and timely interventions which ultimately results in birth of a neonate who is preterm.[11] In developing countries like India, incidence of perinatal morbidity is high due to the poor resource setting. So, to decrease perinatal morbidity, it becomes important to use strict asepsis, antibiotics and proper induction protocol.[5] Premature rupture of membranes is one of the most challenging and controversial obstetric dilemmas which occurs even in low-risk pregnancies.[12] So, this study was done to know foetal outcome in cases with PROM with gestational age more than 28 weeks.

METHODS

A prospective longitudinal study was conducted in Department of Obstetrics and Gynaecology at a tertiary care hospital from 2018 to 2020 (18 months). A total of 275 patients admitted with complaints of per vaginal leaking with gestational age more than 28 weeks were studied.

Inclusion criteria

Cases admitted with PROM at >28 weeks of gestation (by 1st trimester ultrasonography) and absence of uterine contraction for at least 1 hour of PROM, reactive NST, singleton pregnancy were included.

Exclusion criteria

Patient with foetal malformation, pre-eclampsia**,** multiple pregnancy, history of previous caesarean section, antepartum haemorrhage were excluded.

The diagnosis of per vaginal leaking was confirmed by per speculum examination, per vaginal examination, obstetric ultrasonography and nitrazine test. Detailed history was taken. General, systemic and obstetric examination was done.

Depending upon gestational age

If gestational age was between 28 to 37 weeks, then

Two doses of injection betamethasone 12 mg intramuscularly were given 12 hours apart were given to expedite foetal lung maturity, short term tocolysis was done in indicated cases, antibiotics were given prophylactically to reduce the risk of infection, maternal monitoring to detect chorioamnionitis was done by monitoring temperature, pulse rate, colour and smell of liquor and abdominal tenderness. Foetal monitoring was done to asses foetal wellbeing. Emergency lower segment caesarean section was done in indicated cases. Neonatal follow up was done.

If gestational age was more than/equal to 37 weeks, then

Antibiotics were given prophylactically to reduce the risk of infection, maternal monitoring to detect chorioamnionitis was done by monitoring temperature, pulse rate, colour and smell of liquor and abdominal tenderness. Foetal monitoring was done to assess foetal wellbeing. Labour was induced in indicated cases and patients were taken for emergency lower segment caesarean section, if indicated. Neonatal follow up was done. For analysis of this data, appropriate version of SPSS was used.

RESULTS

Foetal presentation and PROM

In my study, most of the cases 95% (262) had cephalic presentation, 4% (11) had breech presentation and 2 (1%) had other presentation (Figure 1).

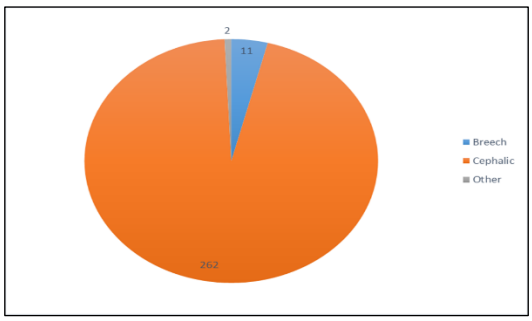

Figure 1: Fetal presentation and PROM.

Birth weight in PROM

In my study, 57% (157) new-borns had birth weight >2.5 kgs followed by 34% (92) new-borns having birth weight between 2-2.5 kgs. 9.4% (26) new-borns had birth weight <2 kgs (Table 1).

Table 1: Birth weight in PROM.

Birth weight (kg)	Number	Percentage
<2	26	9.43
2-2.5	92	33.39
>2.5	157	56.99
Total	275	100

5' APGAR score in PROM

In my study, 60% (166) new-borns had APGAR score 8/10, 10.5% (29) new-borns had APGAR score >9/10. 16% (45) had APGAR score 7/10 and 10.5% (29) cases had APGAR score 6/10. 6 new-borns (2%) had APGAR score 2/10.

Maturity of foetus and PROM

In my study, 71% (196) new-borns were term, whereas remaining 29% (79) were preterm (Figure 2).

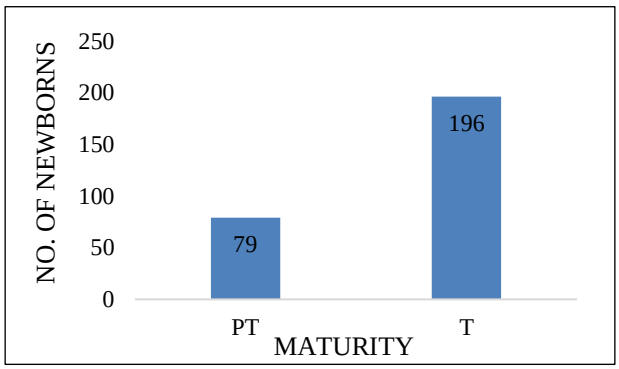

Figure 2: Maturity of fetus and PROM.

Perinatal morbidity in PROM

In my study, 40% (109) had NICU stay. Out of 109, 69 (63%) had NICU admission for 1 day for observation. Remaining 40 (37%) had NICU stay for 5 days due to prematurity and low birth weight. 6% (17) had respiratory distress syndrome (RDS), 3% (8) had neonatal sepsis, 2% (6) had neonatal hypoglycaemia. 2 out of 8 cases of neonatal sepsis died (Figure 3).

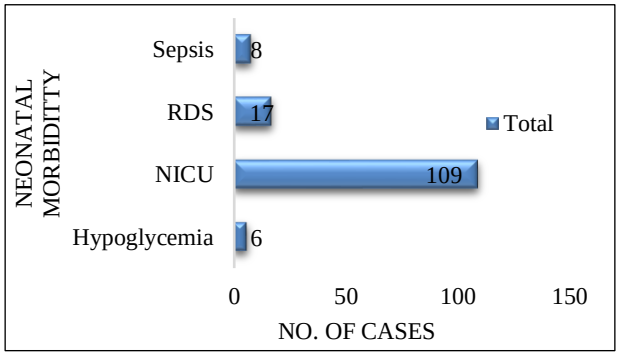

Figure 3: Perinatal morbidity in PROM.

Perinatal mortality in PROM

In my study perinatal mortality rate was 1% (3). 2 out of 3 died due to extreme prematurity complicated neonatal sepsis (75%) and 1 had complex heart disease not compatible with life (25%) (Table 2).

Table 2: Perinatal mortality in PROM.

Perinatal mortality	Number	Percentage
Yes	3	1.08
No	272	98.92
Total	275	100

DISCUSSION

In present study, most common foetal presentation was cephalic (95%). Similar findings were seen in a study conducted by Sajitha et al and Swati et al which had 93% and 88% of cases having cephalic presentation respectively.[13,14] In my study, 4% of cases had breech presentation, which is less as compared to a study conducted by Sajitha et al and Swati et al which had 10% and 8% breech presentation respectively.[13,14] In my study, 1% of cases had other presentation which is less as compared to a study conducted by Swati et al which had 4% cases who had other presentation.[14]

In our study, 57% new-borns had birth weight more than 2.5kgs which is comparable to a study conducted by Tripti et al which had birth weight more than 2.5kgs in 52% new-borns.[15] Low birth weight (<2.5kgs) was seen in 42% new-borns in my study, which is comparable with a study conducted by Tripti et al which had low birth weight in 48% new-borns and is more as compared to a study conducted by Abirami et al which had low birth weight in 32% new-borns.[15,16]

In our study, 29% new-borns had low APGAR score (less than or equal to 7) which is comparable with study conducted by a study conducted by Tripti et al which had low APGAR score in 32% new-borns.[15] In my study, remaining 71% new-borns had good APGAR score (more than or equal to 8) which is comparable with a study conducted by Tripti et al which had good APGAR score in 68% new-borns and which is less as compared to a study conducted by Abirami et al which had good APGAR score in 91% new-borns.[15,16]

In our study, 71% new-borns were term which is comparable to studies conducted by Tripti et al and Kshama et al which had 71% and 82% new-borns which were term respectively.[15,17] My study had 29% new-borns which were preterm which is comparable to studies conducted by Tripti et al which had 29% births which were pre-term.[15]

In our study, 39% new-borns had NICU stay which is comparable to a study conducted by Sajitha et al in which NICU stay was required in 45% new-borns.[13] My study

had respiratory distress syndrome and sepsis in 6% and 3% respectively which is less as compared to a study conducted by Sajitha et al which had respiratory distress syndrome and sepsis in 20% and 50% new-borns respectively.[13]

In our study, perinatal mortality was seen in 1% new-borns which is less as compared to a study conducted by Swati et al which had perinatal mortality in 12% new-borns and study conducted by conducted by Sajitha et al which had perinatal mortality in 3% cases.[14,13] In present study, 75% of neonatal mortality was due to prematurity which is comparable to study conducted by Sajitha et al which had prematurity as cause of death in 75% of all cases and is more as compared to a study conducted by Swati et al which had prematurity as cause of death in 42% of cases.[13,14]

This study has some limitations. Maternal outcome was not assessed. Being a prospective longitudinal study, cases were lost to follow up for maternal outcome.

CONCLUSION

Gestational age at which patient has PROM is very important because neonatal prognosis mainly depends on that because once there is a PROM delivery is imminent. In patients with history of Early Onset Neonatal Sepsis (EONS) and preterm delivery in previous pregnancy, GBS (Group B streptococcus) prophylaxis should be done to improve foetal outcome in subsequent pregnancies. Antenatal corticosteroid administration is associated with decrease in neonatal morbidity like NICU stay, development of hyaline membrane disease especially when gestational age is less than 34 weeks. Antenatal corticosteroids should be administered and to get enough time for corticosteroid cover, short term tocolysis should be done. Termination of pregnancy should be considered at the earliest suspicion of chorioamnionitis. Looking after preterm infants puts an immense pressure on family, economy and health care resources in developing countries like India. Being multifactorial, prevention of PROM is difficult so more focus should be on management of PROM.

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