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Original Research Article

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

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ABSTRACT

Background: Premature rupture of membranes is rupture of membranes before the onset of labour irrespective of gestational age. PROM is associated with variety of maternal complications from chorioamnionitis, unfavourable cervix, dysfunctional labour to caesarean rates, postpartum haemorrhage and endometritis in mother. PROM is a still one of the most difficult and controversial problems in obstetrics.
Methods: This was a prospective longitudinal study conducted in a tertiary care hospital from 2018 to 2020 (18 months). Total 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 maternal outcome.
Results: PROM was common in women belonging to low socio-economic status (68%). Most of the cases were unbooked (73%), primigravida (42%) belonging to age group 21-25 yrs. (46%), and had gestational age more than 37 wks. (71%). 62% of cases delivered vaginally while remaining underwent LSCS, most common indication being oligohydramnios (35%). Post partum fever (14%) was most common morbidity followed UTI (7%).
Conclusions: In present study, PROM was common in unbooked cases and women belonging to low socioeconomic status. Asymptomatic bacteriuria was most common predisposing factor. Maternal morbidity corresponds to duration between PROM and delivery. Early diagnosis and appropriate management reduces hospital stay and maternal morbidity.

Keywords: Maternal, Per vaginal leaking, Premature rupture of membranes

INTRODUCTION

Premature rupture of membranes (PROM) is defined as rupture of membranes at any time before the onset of labour irrespective of gestational age.[1] Studies in developing countries have shown that the incidence of PROM is around 18-20%.[2,3] Preterm premature rupture of membranes (PPROM) occurs in 1-5% of all pregnancies.[4]

Foetal membranes are made of an outer four to six layered chorion attached to a collagen rich connective tissue and an inner single cell layer amnion.[5] At term, programmed cell death and activation of catabolic enzymes, such as collagenase and mechanical forces, result in ruptured membranes. Preterm PROM occurs probably due to the same mechanisms and premature activation of these pathways. However, early PROM also appears to be linked to underlying pathologic processes, most likely due to inflammation and /or infection of the membranes.

PPROM is associated with increased risk of chorioamnionitis, unfavourable cervix, dysfunctional

labour, increase in caesarean rates, postpartum haemorrhage, postpartum febrile morbidity and endometritis in mother. In foetus increased occurrence of hyaline membrane disease, intraventricular haemorrhage, sepsis, cord prolapse, foetal distress and increased foetal mortality. Prematurity is the principal risk to the foetus while infectious morbidity is the primary maternal risk.[6] Cases of PROM are prone to cord compression/cord prolapse and are associated with high risk of ascending infection. Longer the time interval between rupture of membranes and onset of labour more the risk of ascending infection and acquiring chorioamnionitis.[7] Managing cases of PROM still remains as one of the most difficult and controversial problems in obstetrics.[8] So, this study was conducted to analyse maternal outcome in cases of PROM.

METHODS

This was prospective longitudinal study conducted in a tertiary care hospital over a period of 18 months. 275 patients admitted with complaints of per vaginal leaking with gestational age more than 28 weeks were studied.

Inclusion criteria

Inclusion criteria were the cases admitted with PROM at >28 weeks of gestation (by 1st trimester ultrasonography), lack of uterine contraction for at least 1 hour of PROM, singleton pregnancy, reactive NST.

Exclusion criteria

Exclusion criteria were multiple pregnancy, history of previous caesarean section, antepartum haemorrhage, foetal malformation, pre-eclampsia.

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

Depending upon gestational age

If gestational age was between 28 to 37 weeks, then

Two doses of betamethasone 12 mg I.M. 12 hours apart were given to enhance foetal lung maturity, short term tocolysis was done in indicated cases, prophylactic antibiotics was given to reduce the risk of infection, Maternal monitoring to detect chorioamnionitis was done by monitoring pulse rate, temperature, abdominal tenderness, colour and smell of liquor, foetal monitoring was done to asses foetal wellbeing, emergency caesarean section was done in indicated cases, patient was followed up after delivery, neonatal follow up was done.

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

Prophylactic antibiotics was given to reduce the risk of infection, maternal monitoring to detect chorioamnionitis was done by monitoring pulse rate, temperature, abdominal tenderness, colour and smell of liquor, foetal monitoring was done to assess foetal wellbeing, if necessary, induction of labour was done, emergency caesarean section was done, if indicated, patient was followed up after delivery, neonatal follow up was done, for analysis of this data, appropriate version of SPSS was used.

RESULTS

Age incidence in PROM

In my study, most of the women (128 = 46%) were in the age group of 21-25yrs. Followed by 29% (79) in age group of 18-20 yrs. 17% (47) was constitutes by 26-30 yrs. and 6.5% (18) was constituted by 31-35yrs. Only 3 women (1.08%) was in age group >35 yrs (Figure 1).

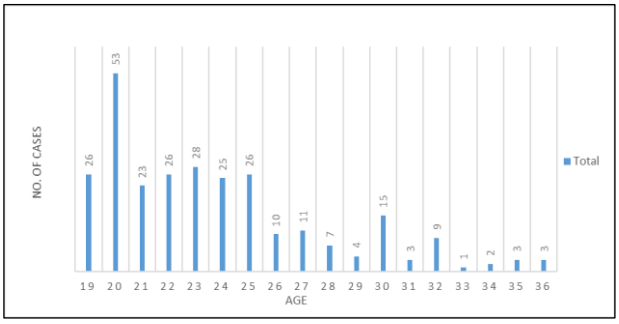

Figure 1: Age incidence in prom.

Latency period in PROM

In my study, 68% (188) women had latent period of 6-12 hours, 26% (72) women had latent period <6 hours. Only, 5.4% (15) women had latent period >12 hours (Table 1).

Table 1: Latency period in prom.

Latent period (hours)	Number	Percentage
<6	72	26.13
6-12	188	68.24
>12	15	5.44
Total	275	100

Incidence of PROM in relation to gestational age

In my study, 71% (196) were term pregnancies, remaining 29% (79) were pre-term. In pre-term, 16% (45) had a gestational age between 34-36 weeks. 12% (34) women had a gestational age of <34 weeks (Table 2).

Obstetric score in PROM

In my study, most of the cases 42% (116) were primigravida's followed by 33% (92) were gravida 2. 15% (41) cases were gravida 3, 5.4% (15) were gravida 4. Only, 11 (4%) women were gravida 5 (Table 3).

Table 2: Incidence of PROM in relation to gestational age.

Gestational age	Number	Percentage
<34 weeks	34	12.34
34-36 weeks	45	16.33
>37 weeks	196	71.14
Total	275	100

Table 3: Obstetric score in PROM.

Parity	Number	Percentage
G1	116	42.10
G2	92	33.39
G3	41	14.88
G4	15	5.44
G5	11	3.99
Total	275	1000

Present history in PROM

In my study, 17% (48) cases had asymptomatic bacteria, 7% (19) cases had short cervix. 13 (4.7%) cases had polyhydramnios, 3 (1.08%) had history of coitus. One case (0.36%) had history of threatened abortion and one (0.36%) had history of PV examination before term (Figure 2).

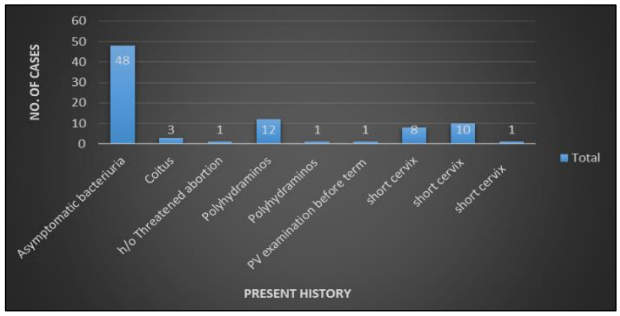

Figure 2: Present history in PROM.

Bacteriological study of amniotic fluid in PROM

In my study, vaginal swab culture of 81% (223) cases showed no growth, 11% (30) cases had growth of Group B *Streptococcus*. 4.7% (13) cases had growth of *E. coli* and 3% (9) cases had growth of *Staphylococcus aureus* (Figure 3).

Mode of delivery in PROM

In my study, 170 women (62%) delivered vaginally and the remaining 38% (105) underwent caesarean section (Table 4).

Type of vaginal delivery in PROM

Of 170 vaginal deliveries 111 (65%) were full term deliveries and remaining 59 (35%) were preterm deliveries. Of the 111 full term vaginal deliveries it included 4 assisted breech deliveries + 2 vaginal birth after caesarean section. Of the 59 preterm deliveries, it included 2 assisted breech deliveries (Figure 4).

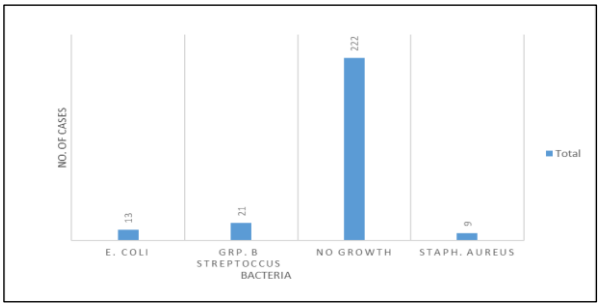

Figure 3: Bacteriological study of amniotic fluid in PROM.

Table 4: Mode of delivery.

Mode of delivery	Number	Percentage
Vaginal	170	61.71
LSS	105	38.11
Total	275	100

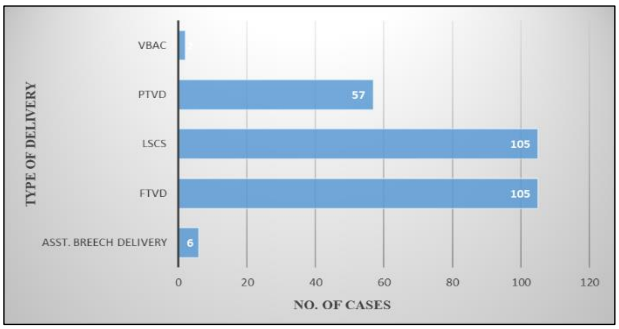

Figure 4: Type of vaginal delivery.

Indication of caesarean section in PROM

In my study, most common indication for LSCS was oligohydramnios (37 cases = 35%), followed by cephalo-pelvic disproportion (26 cases =25%). Foetal distress was the indication in 18% (19) cases, whereas prolonged PROM was the indication in 10.5% (11) cases. Failure of induction was the indication in 4.7% (5) cases, whereas malpresentation was indication in 6.67% (7) cases-5 breech + 2 transverse lie (Figure 5).

Maternal morbidity in PROM

In my study, most common maternal morbidity was post-partum fever that was seen in 14% (38) cases, followed by urinary tract infection that was seen in 6.5% (18) cases. PPH (post-partum haemorrhage) occurred in 2.5% (7) cases, wound gape occurred in 2.5% (7) cases. 7 cases (2.5%) cases had chorioamnionitis (Figure 6).

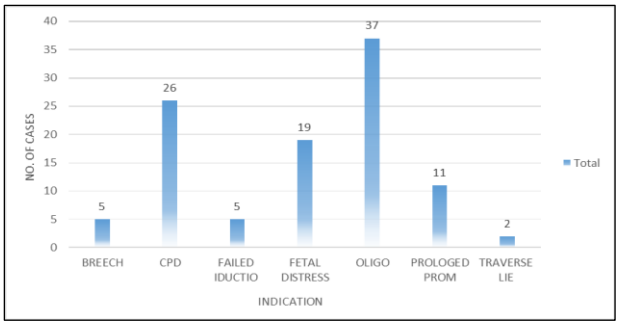

Figure 5: Indication of caesarean section in PROM.

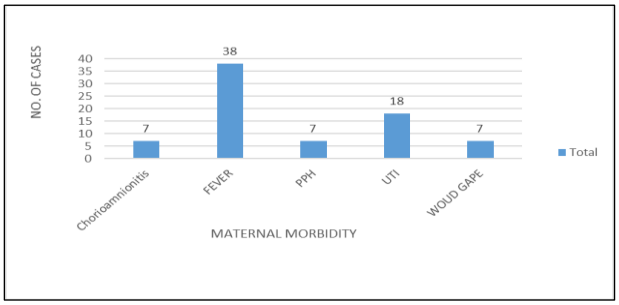

Figure 6: Maternal morbidity in PROM.

DISCUSSION

In our study, the average age was 24 years. Maximum number of patients were in the age group of 21-25 yrs. (46%) Similar findings was seen in study conducted by Kshama et al (52%).[9] In the age group of 18-20yrs. my study had 29% cases which is more as compared to a study conducted by Sailaja et al which had 18%.[10] This study had 7% of cases above age group of 30yrs. Similar finding was seen in a study conducted by Kshama et al (10%) and Amulya et al (6%).[9,11]

In our study, 94% cases had latent period less than or equal to 12 hours. Nearly similar findings were seen in a study conducted by Pratibha et al which had 75% cases having latent period less than or equal to 12 hours.[14] In my study, 5% cases had latent period more than 12 hours which is less in comparison to a study conducted by Tripti et al which had 43% cases having latent period more than 12 hours.[13]

In our study, 71% cases had gestational age more than equal to 37 weeks. Similar findings were seen in a study conducted by Tripti et al (71%) and Kshama et al (80%) which is comparable.[13,9] In my study, 28% cases had gestational age less than 37 weeks which is comparable with a study conducted by Tripti et al which had 29% cases had gestational age less than 37 weeks and is more in comparison to a study conducted by Kshama et al which had 18% cases having gestational age less than 37 weeks.[13,9]

In present study, 42% cases were primigravida which is comparable with a study conducted by Sailaja et al which had 58% cases.[10] In my study, remaining 58% cases were multigravida. Slightly lesser no. of cases were multigravida (42%) in a study conducted by Sailaja et al.[10]

In present study, 5% had polyhydramnios, which is comparable to a study conducted by Sajitha et al which had polyhydramnios in 4% cases.[12] In my study, 1% of cases had history of coitus which is less as compared to a study conducted by Swati et al which had history of coitus in 14% of cases.[16] In my study, 17% cases had asymptomatic bacteriuria, similar findings were seen in a study conducted by Amulya et al which had asymptomatic bacteriuria in 16% of cases.[11]

In present study, no growth was seen in vaginal swab culture in 80% cases which is more in comparison to a study conducted by Sailaja et al which had no growth in 49% cases.[10] In my study, most common organism isolated in vaginal swab culture was group B *streptococcus* (11%) which is comparable to a study conducted by Amulya et al which had group B *streptococcus* growth in 15% cases.[8]

In this study, 61% cases delivered vaginally which is comparable with a study conducted by Kshama et al and Swati et al who had vaginal deliveries in 63% and 57% cases respectively.[9,16] In my study, 38% underwent LSCS which is comparable with a study conducted by Kshama et al which had LSCS in 37% cases and is more as compared to a study conducted by Sailaja et al which had LSCS in 28% cases.[9,10]

In present study, most common indication for LSCS was oligohydramnios (35%) which is comparable to studies conducted by Sajitha et al and Kshama et al which had oligohydramnios as indication for LSCS in 28% and 26% of cases respectively.[9,12] In my study, cephalo-pelvic disproportion was indication for LSCS in 25% cases which is more as compared to a study conducted by Abirami et al which had cephalo-pelvic disproportion as indication for LSCS in 15% cases.[15] Foetal distress was the indication for LSCS in 18% cases which is less as compared to a study conducted by Abirami et al which had foetal distress as indication for LSCS in 25% cases.[15]

In our study, 71% newborns were term which is comparable to studies conducted by Tripti et al and Kshama et al which had 71% and 82% newborns which were term respectively.[13,9] This study had 29% newborns which were preterm which is comparable to studies conducted by Tripti et al which had 29% births which were preterm.[13]

In present study, most common maternal morbidity was post-partum fever which was seen in 14% cases and is comparable to study conducted by Amulya et al in which post-partum fever was seen in 9% cases.[8] Urinary tract infection was seen in 7% cases in my study which is comparable with a study conducted by Pratibha et al which had UTI in 5% cases.[14] Post-partum haemorrhage was present in 2% cases which is comparable to a study

conducted by Amulya et al which had PPH in 2% cases.[11] Chorioamnionitis happened in 3% cases in my study which is less as compared to a study conducted by Swati et al which had chorioamnionitis in 6% cases.[16]

In this study, neonatal outcome was not assessed. As this was a prospective longitudinal study, so cases were lost to follow up for neonatal outcome. This was limitation of this study.

CONCLUSION

No specific aetiology or risk factors are known that leads to development of PROM. But in our study asymptomatic bacteriuria was seen in 18% cases of PROM. PROM is more common in primigravida and those belonging to low socio-economic status. This might indicate that undernourishment leads to development of PROM. Main maternal morbidity is infectious. Induction of labour and expectant management are the options to manage cases of PROM, both have their benefits and drawbacks. In cases where induction of labour is done, there is increase in incidence of instrumental deliveries and caesarean section. In cases where expectant management is done there is increase in neonatal morbidity like increased duration of NICU stay and in mother it leads to complications like chorioamnionitis, cord prolapse and abruptio placentae. 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, tocolytic drugs can be used, to improve neonatal outcome. Administration of injectable antibiotics in cases of PROM decreases incidence of maternal morbidity. The prevention of PROM is difficult so more focus should be on management of PROM.

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