

Sharing the Experience of Management of Neonates with Maternal Premature Rupture of Membranes

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ABSTRACT

Background: Neonates with the maternal premature rupture of membranes are commonly encountered in the clinical practice. The condition has an important implication for the management of neonates, as it is associated with certain risks of morbidity and mortality. The management varies among the physicians. The study aimed at evaluating out the neonatal outcome of the existing condition with institutional practice.

Methods: The study was conducted at King Khalid Hospital, Al Majmaah KSA from August 2016 to August 2017. Two hundred neonates born to mothers with premature rupture of membranes were evaluated, monitored and treated in neonatal unit. Septic screening was done in all the neonates and empiric antibiotics were started for all the neonates. Maternal risk factors were taken into consideration. Neonatal outcomes were considered in all cases.

Results: There were 111 male and 89 female neonates. Most of the cases were term prom while 68 cases were pre-prom. Most commonly associated complication was feeding intolerance found in 16% of cases. Only two neonates had a positive blood culture for group B streptococci. Maternal high vaginal swab yield group B streptococci in 17 cases. Sepsis developed in three cases. One hundred and ninety eight neonates were discharged home while one patient died of severe sepsis.

Conclusion: PROM is a common clinical entity that requires careful handling of the neonates to prevent the mortality and morbidity. With prompt treatment, the outcome can be significantly improved.

Keywords: PROM – neonates – chorioamnionitis – complications – outcomes

INTRODUCTION

Premature rupture of fetal membranes (PROM) implies the rupture of membranes before the onset of the labor. PROM can occur at term or preterm. PROM occurs approximately in 8-10% of all term pregnancies^[1]. Prolonged rupture of membranes is considered when the duration is more than 24 hours^[2]. PROM is mainly a clinical diagnosis, which is suggested by history of watery vaginal discharge that can be confirmed by speculum examination^[2]. Preterm PROM is the leakage of amniotic fluid prior to the onset of labor at less than 37 weeks of gestation^[3].

Pre-PROM accounts for 30-40 % all preterm deliveries^[4]. Certain tests like nitrazine test can be used to confirm the diagnosis^[5]. These tests are based on finding the pH of the amniotic fluid.

PROM is a common and major cause of neonatal morbidity and mortality. Early onset neonatal infection is the most serious complication associated with PROM^[6]. The risk of mortality is increased to four times in presence of neonatal sepsis. Risk of neonatal sepsis increases with increase in time from rupture of membranes to eventual delivery^[7].

Neonatal outcomes are adversely affected if the PROM is associated with chorioamnionitis. Complications like fetal distress, cord prolapse, placental abruption, intra-ventricular hemorrhage, fetal and neonatal deaths are associated with PROM^[8-11].

PROM is considered as a major risk for the neonatal sepsis but there is lack of consensus on the treatment of the neonate without the evidence of infection^[12].

Treatment of the mother following PROM is highly variable; however, these treatments include broad-spectrum antibiotics that aim to reduce the neonatal and maternal mortality thus improving the outcome^[13,14]. Considering the importance of PROM, we conducted this study to evaluate the impact of the disease and find out the outcome of the neonates with our current institutional practice.

MATERIALS AND METHODS

This cross-sectional study has been conducted in King Khalid Hospital Majmaah from August 2016 to August 2017.

Neonates with maternal history of premature rupture of membranes for 18 or more than 18 hours were included in the study. Premature rupture of membranes (PROM) was considered based on details provided by the obstetric department. Maternal history including other risk factors like gestational diabetes, hypertension, or other significant illness was also noted. Gestational age, mode of delivery and parity was also considered. All the neonates were delivered inside the hospital and were provided neonatal resuscitation by skilled physicians. Neonates were examined in detail and APGAR scores were evaluated. All the neonates were kept in nursery department for further treatment and observation.

Neonates were monitored for the vital signs, feeding and general care. They were examined regularly for the presence of any danger signs like apneas, lethargy, feeding intolerance, poor activity and seizures.

All the neonates were investigated by complete blood counts, C reactive protein (CRP), and blood cultures. X-ray chest and CSF examination were performed in certain cases, pertaining to the presence of signs indicating respiratory pathologies or CNS involvement respectively.

We followed the institutional guidelines and all the neonates with maternal history of PROM for 18 or more than 18 hours were started on empiric intravenous Ampicillin and gentamycin which were continued until the negative primary blood culture came as negative bacterial growth. Antibiotics duration was extended in cases of complications like clinical sepsis, meningitis or maternal growth of group B streptococci on high vaginal swab.

The study was done after approval of ethical board of Majmaah university.

RESULTS

We had 200 cases of neonates with maternal history of PROM. Male neonates were 111 and females 89. Out of 200 cases, 97 were born by caesarean section and 103 were delivered by normal vaginal delivery. We had 68 cases born before term and had therefore pre-PROM while rest of 132 cases had term PROM.

Minimum duration of rupture of membranes was 18 hours and maximum was 96 hours. Most common duration for antibiotic use was 4 days (40%) followed by 5 days, which was in 51 cases(25.5%).

Most of the neonates (198) were discharged home. One neonate was referred to higher center and one died of severe sepsis.

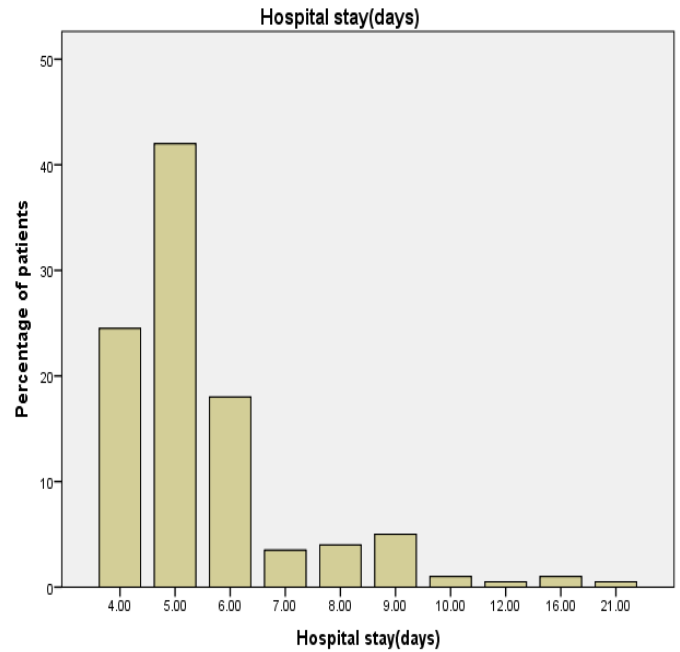


Figure 1: Hospital stay in days

Table 1: Complications in neonates

Complications	Number of patients	Percentage
Sepsis	3	1.5%
Meningitis	2	1%
Pneumonia	5	2.5%
Necrotizing enterocolitis	2	1%
Feeding intolerance	32	16%

Table 2: Frequency of gestational age

Gestational age (weeks)	Frequency	Percent
32	1	0.5
33	2	1.0
34	6	3.0
35	13	6.5
36	46	23.0
37	54	27.0
38	37	18.5
39	25	12.5
40	11	5.5
41	5	2.5
Total	200	100.0

Most common duration of PROM was 24 hours. Mean was 29.22 and median was 24 hours. We found that most common other maternal risk factor was gestational diabetes, which was present in 34 cases.

Mean WBC count was 19.37 ± 2.28 thousands. Mean count for absolute neutrophils was 13.28 ± 2.24 thousands. CRP was raised in 9% of cases. Only two cases had a positive blood culture growth for group B streptococcus (GBS). Maternal high vaginal swab yield positive result for GBS in 17 cases and 23 were positive for mixed bacterial growth. Maternal risk factors were also observed with gestational diabetes as the most common one found in 34 (17%) cases. Maternal hypertension was observed in eight cases.

Complications were seen in 37 cases (18.5%). Feeding intolerance was the most common complication in the neonates.

No significant association was observed between complications and mode of delivery and p value is equal to 0.479. Similarly, no significant association was observed between the complications and gender, p value is equal to 0.204. However, significant association was observed between the complications and preterm/term PROM, p value is 0.004. Complications were found in 29% and 12% in pre-prom and term prom respectively.

DISCUSSION

The objective of our study was to find out the neonatal outcomes of the PROM and highlight the issues related to that like rate of complication, duration of antibiotics and outcomes.

Outcome of the neonates was good in our study as 99% of the cases were discharged home; these results are comparable to those observed in the Parkland hospital^[12].

Results of blood cultures in our study confirm those of another study conducted by Jackson in Parkland hospital where out of 206 cases of PROM none of the blood cultures was positive in the neonates^[12]. Our study showed that three cases suffered sepsis in which two had positive blood cultures (66%) for GBS. Blood cultures were not positive in the majority of cases, as they did not have the significant complications like sepsis or meningitis.

Complications occurred in 18.5% of cases. Excluding the feeding problems, infections related complications rate(6%) was comparable to a study conducted in Iran, which was 7.7%^[15].

Incidence of neonatal sepsis in our study was just 1.5%, which is quite low in comparison to other studies^[15]. Another study in India reported incidence of neonatal sepsis as 14.5%^[16]. Low incidence of neonatal sepsis in our study might be due to empirical antibiotics therapy to the neonates.

Incidence of complications was significantly high in pre-PROM than in term-PROM patients in our study which is comparable to the study from India^[16].

In our study feeding intolerance was the most common complication in the neonates and was found in 16% of cases, while in another study conducted in India, feeding problems were the second most common complication among such cases, 47.5%^[16].

There was insignificant difference of complications among the male and female neonates while a study in India revealed a significant difference of complications among the male and female cases^[16].

Likewise, the incidence of complications in the neonates delivered by normal vaginal delivery was 26% and 17% in neonates born by C-section which was insignificant while some other studies reported from India and Pakistan had a significant difference of complications with respect to mode of delivery^[16-19].

C-reactive protein (CRP), an acute phase reactant, begins to rise in 4-6 hours of the onset of infection. It becomes significantly raised in next 24 hours and peaks in 2-3 days. Initial value of CRP may be normal if it is done earlier in the disease. CRP is not raised in all infants with systemic bacterial infections and is normal in up to 50% cases. A normal CRP does not rule out sepsis. We found the sensitivity and specificity of CRP equal to 42% and 92% respectively.

Latency period, which is the time between the rupture of membranes and the delivery of the child, did not affect adversely the neonatal outcomes in our study. Similar results were seen in another study as well conducted by Manuck^[29]. Some studies have shown that prolonged latency period leads to adverse neonatal outcomes^[21].

Some studies reported higher rates of neonatal complications with prom like the one in china reported infections related complications as 31.3% and blood cultures were positive in 12.6%^[21].

One study in California concluded that prom does not affect the neonatal outcome; however, others

consider it as a major risk factor for the neonatal outcome^[22].

CONCLUSION

Premature rupture of membranes is a common clinical presentation, which requires careful handling for the better outcomes. Institutional guidelines may vary for the management and local studies may help to validate them. Our study indicated that our local treatment protocols result in better and safe neonatal outcomes.

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