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To study the maternal and perinatal morbidity and mortality in PPROM cases with its correlation with duration of latency period and labour outcome

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Abstract
Introduction: PPROM is one of the important causes of preterm birth that can result in high perinatal morbidity and mortality along with maternal morbidity. Looking after a premature infant puts immense burden on the economic and health care resources of the country; therefore risk scoring strategies involving the demographic variables along with previous history of preterm deliveries should be developed to identify high risk cases and treating them prior to rupture of membranes.
Material and Methods: A total of 51 patients presented with PPROM to department of obstetrics and gynaecology TMMC & RC, Moradabad during period July 2018-2019. After detailed history and examination, patients were evaluated for various maternal and neonatal morbidity and mortality with its correlation to duration of latency period and labour outcome.
Results: In current study, most of the patients delivered vaginally (76.47%) and LSCS (23.52%) were done for other obstetrics indication. While on conservative management, a rigorous vigil is kept for features of chorioamnionitis. The major concern in delaying delivery with ruptured membranes is the risk of infection which can be deleterious for both mother as well as foetus. There is a significant association of clinical and histological chorioamnionitis with chances of NICU admission due to respiratory distress syndrome in neonate.
Conclusion: Identification and timely referral for specialized obstetrical evaluation and management of these high risk women pre-conceptually or in early pregnancy, is important in reducing the morbidity, mortality, psychological trauma and expense associated with preterm birth.

Keywords: Latency period, chorioamnionitis

Introduction
Overall incidence of preterm premature rupture of membranes (PPROM) is 3% but it accounts for 30% neonatal mortality and morbidity [1]. The reason thought to be infection and prematurity. At term (<37 weeks' gestation), 50% of pregnancies complicated by PROM will go into labor spontaneously within 12hr, 70% within 24 hr, 85% within 48 hr, and 95% within 72 hr in the absence of obstetric intervention [2]. The probability of neonatal mortality and morbidity related with PPROM decreases with longer latency and advanced gestational age. What affects the latency period is not clear, even though many factors have previously been linked which shortened latency period includes, intraamniotic infection, placental abruption, and fetal distress [2]. Major complications are prematurity and its recognized squeal such as respiratory distress syndrome, intraventricular haemorrhage and necrotizing enterocolitis. Feto-maternal outcome depends on many factors mainly on gestational age, treatments (antibiotics, steroids) performed, length of labor and development of chorioamnionitis intrapartum. Gestational age is the leading factor assessing the likelihood of perinatal morbidity and mortality at the time of presentation [3]. Therefore, the plan to abandon the expectant management of PPROM in favour of delivery includes a vigilant evaluation of potential complications vs. gestational age related neonatal morbidity & mortality due to intensional preterm delivery [4]. This knowledge may help out obstetricians with risk stratification and consultation regarding the natural course of expectant management for cases of PPROM.

Material and Methods
The present observational prospective study was conducted in Department of Obstetrics and Gynaecology Teerthanker Mahaveer Medical College and Research Centre,

Moradabad during period July 2018-2019. All Patients admitted in Department of Obstetrics of TMMC & RC with PPROM with Gestational age more than 24 weeks and less than 37 completed weeks were included in the study. After taking complete history and examination, patients were investigated and evaluated for maternal and perinatal morbidity and mortality in PPROM cases & its correlation with duration of latency period.

Exclusion criteria

Patients with intrauterine fetal death, congenital anomalies, cord prolapse or any maternal illness which warrants immediate termination of pregnancy were excluded from the study.

Statistical analysis

Calculating mean and standard deviation for the continuous variables was used to perform descriptive statistics. As absolute numbers and percentage, categorical variables are presented. SPSS (Statistical Package for Social Sciences) version 25.0 and MedCalc software were the software used for statistical analysis.

Results and observations

A total of 51 patients were included in the present study. In orde r to study the maternal and perinatal morbidity and mortality in PPROM cases with its correlation with duration of latency period, various factors were studied.

Table 1: Association of chorioamnionitis with latency period

Latency	Chorioamnionitis	
	No	Yes
<48 hours	34	6
	85.0%	15.0%
48 hours or more	10	1
	90.9%	9.1%

Chi-square value = 4.110, *p*-value = 0.044

Chorioamnionitis was significantly more among subjects with latency less than 48 hours compared to subjects with latency > 48 hours. Its diagnosis is clinical. Patient may present with pain abdomen, fever or offensive discharge.

Table 2: Mode of delivery in PPROM cases

	Mode of delivery	
	LSCS	Vaginal delivery
Latency <48 hours	8	32
	20.0%	80.0%
Latency 48 hours or more	4	7
	36.4%	63.6%

Chi-square value = 5.668, *p*-value = 0.029*

LSCS was significantly more among subjects with latency less than 48 hours compared to subjects with latency > 48 hours. Due to oligohydramnios, most patients had developed fetal distress and as a consequence has undergone LSCS.

Table 3: Association of APGAR score at 1 minute with latency period

Latency	APGAR score at 1 minute	
	< 7	≥ 7
Latency < 48 hours	27	13
	67.5%	32.5%
Latency 48 hours or more	4	7
	36.4%	63.6%
Total	27	13
	67.5%	32.5%

Chi-square value = 3.083, *p*-value = 0.047*

APGAR score at 1 minute < 7 was significantly more among subjects with latency less than 48 hours compared to subjects with latency > 48 hours. Considering the effect on birth weight and NICU stay, prolongation of pregnancy even up to 36 weeks can be practiced at centres where optimum neonatal facilities are not readily available or where cost is limiting factor.

Table 4: Association of NICU admission with latency period

Latency	NICU admission	
	No	Yes
Latency < 48 hours	18	22
	45.0%	55.0%
Latency 48 hours or more	8	3
	72.7%	27.3%

Chi-square value = 3.262, *p*-value = 0.046*

Table 4 shows NICU Admission was significantly more among subjects with latency less than 48 hours compared to subjects with latency>48 hours. There was no morbidity because of prematurity and infection.

Discussion

In current study, chorioamnionitis was significantly more among subjects with latency < 48 hours (*p*-value = 0.044). It is imprecise to access the latency period in women with PPROM and therefore it is difficult to inform women with PPROM regarding their expected latency period. Our study found latency period duration to be inversely proportional to period of gestation. In view with various studies, a strong association between gestational age and latency was also noted.

The latency period ranged from 0 to 59 days and was inversely r elated to the admission gestational age (r = -0.63, $P < 0.001$) period with gestational age (r = -0.386). This was similar to the study by Melamed *et al* [5].

The high incidence of maternal and neonatal infection can result from reduced amniotic fluid antibacterial activity which is low during early pregnancy and increases with gestational age. LSCS was significantly more among subjects with latency < 48 hours (*p*-value = 0.029). In present study, 22.6% had LSCS delivery. It was the same as the analysis by Poovathi M *et al* [6] 64% of cases had delivered vaginally and 36% had delivered by LSCS. In a study by Sheela *et al* 65% had vaginal delivery compared to 16% by LSCS. Our study showed that APGAR score at 1 minute < 7 was significantly more among subjects with latency < 48 hours (*p*-value = 0.047). In the study by Poovathi *et al* [6], 94.0% babies had first minute APGAR score of >7.

At all gestational ages the risk of respiratory distress is greater than risk of infection.

NICU Admission was significantly more among subjects with latency < 48 hours (*p*-value = 0.046). In the study by Poovathi *et al* [6], 82% of new-born needed NICU admission out of which all early PPROM (28 -32 weeks) new-born got admitted in NICU.

In the study by Rajan *et al* [7], the average duration of neonatal ICU stay for infants was 3.3 days. The overall duration of neonatal ICU stay decreased with increasing gestational age. The duration of NICU stay between 24-28 weeks was on an average 4.2 days, between 29-33 weeks, 3.4 days and between 34-36 weeks, 2.4 days.

Adequate ventilation facilities and infection control measures would be necessary to achieve reasonable outcomes in the high risk neonates. Sepsis is a common preventable cause of such neonate morbidities in such patients. NICU Admission was significantly more among subjects with latency less than 48 hours compared to subjects with latency > 48 hours in our study.

It seems clear that expectant management to improve fetal pulmonary maturity should dominate other considerations before 36 weeks, while infection is a concern especially before 28 weeks.

This imposes significant economic burden on the patient and her family members. Notwithstanding the prime importance of accurate data on neonatal major and minor morbidity PPROM pregnancies, such morbidities have been thoroughly described by few studies to identify an optimal gestational age for PPROM-complicated pregnancy delivery. In the present study, a systematic evaluation of maternal and neonatal morbidity is being made in women with PPROM who were managed on expectant line of management protocol.

Conclusion

The overall effect of latency duration on neonatal outcome can be viewed as fine balance between positive effects (eg-advanced lung maturity) and negative effect that exposes fetus to unfavourable intrauterine environment. NICU Admission was significantly more among subjects with latency less than 48 hours compared to subjects with latency more than 48 hours. Probably these foetuses did not receive the benefit of expectant management. Thus we suggest that immediate delivery after PPROM should not be practiced rather patients should be kept on expectant management as long as possible till fetus attains lung maturity.

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