

# 182 Cases of Premature Rupture of Membranes and Treatment Strategy Analysis

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**ABSTRACT Objective:** Related factors and treatment strategies of premature rupture of membranes (PROM) were discussed. **Method:** Retrospective analysis of 182 cases of preterm premature rupture of membranes (PPROM) from Yanshan County Hospital from January 2010 to October 2014. **Results:** From the 182 cases [123 vaginal delivery and 59 cesarean section (C-section)], there were 79.12% PROM cases were detected in the presence of risk factors. Neonatal mortality and complications were significantly higher at 28–33 + 6 weeks of pregnancy than those at 34–36 + 6 weeks, 28–33 + 6 weeks, and 34–36 + 6 weeks. **Conclusion:** In order to improve the survival rate of newborns, the related factors leading to PPRM should be treated.

## KEYWORDS

Premature rupture  
Neonate  
Treatment strategy

## 1. Introduction

Preterm premature rupture of membranes (PPROM) or premature rupture of membranes (PROM) is rupture of the amniotic sac in pregnant women after about 36 + 6 weeks of gestation. It is one of the serious problems in obstetrics and could trigger a series of complications [1]. In this paper, 182 cases of PPRM were analyzed and the related issues discussed.

## 2. Materials and methods

General data: There were 5909 cases of delivery in our hospital from January 2010 to October 2014. 182 cases of PROM were reported in the same period (3.08%).

## 3. Results

PROM cases were shown in Table 1. Delivery modes of the 182 [123 vaginal delivery and 59 cesarean section (C-section)] cases of PROM were tabulated in Table 2.

From a group of 182 cases, 2 cases of neonatal deaths were reported and among them, 1 case involving twin

**Table 1.** 182 cases of PROM.

Reasons	Cases	Percentage (%)
Genital tract pathogenic microorganism infection	64	35.16
Breech	51	28.02
Excess amniotic fluid	11	6.04
Twins	9	4.95
Cervical relaxation	4	2.20
Pregnancy complicated with hypertension	4	2.20
Pregnancy complicated with uterine myoma	1	0.55
Reasons unknown	38	20.88

**Table 2.** Comparison of delivery modes during different gestational weeks.

Gestational weeks	Cases	Natural labor		Breech delivery		Caesarean section	
		Cases	%	Cases	%	Cases	%
28–31 + 6	9	7	77.78	2	22.22	0	0
32–33 + 6	100	51	51.00	4	4.00	45	45.00
34–36 + 6	73	55	75.34	4	5.48	14	19.18
Total	182	113	62.09	10	5.49	59	32.42

pregnancy at 28 + 2 weeks and 1 natural birth weighing at 2060 g. Neonatal births were tested for 1 minute APGAR scores, respiratory disease syndrome (RDS), hypoxic-ischemic encephalopathy (HIE), subarachnoid hemorrhage and pneumonia. Survival rates in the 207 cases with kinds

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**Table 3.** Neonatal outcome.

Gestational weeks	Neonatal number	1 Minute APGAR Score ≤ 7 points		1 Minute APGAR Score > 7 points		RDS		HIE		Subarachnoid hemorrhage		Neonatal pneumonia	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
28–31 <sup>+6</sup>	10	6	60	4	40	6	60	6	60	2	20	4	40
32–33 <sup>+6</sup>	110	10	9.09	100	90.91	2	1.82	4	3.64	0	0	4	3.64
34–36 <sup>+6</sup>	87	7	8.05	80	91.95	0	0	2	2.30	0	0	2	2.30
Total	207	23	11.11	184	88.89	8	3.86	12	5.80	2	0.97	10	4.83

of complications were found in Table 3.

## 4. Discussion

### 4.1. Pathogenesis and characteristics of PROM

There are many factors leading up to PROM. The most common factors are: (1) Reproductive tract infections at the lower genital tract causing fetal membrane inflammation, decreasing local tension and causing bursting of membranes. Infections are commonly caused by the B group hemolytic Streptococcus, gram-negative bacilli, *Trichomonas vaginalis*, anaerobic bacteria, mycoplasma, and *Chlamydia trachomatis* [2]; (2) Changes in the amniotic membrane pressure, common in twin pregnancies and hydramnios; (3) Abnormal fetal position, fetal presentation not cohesive causing uneven pressure and rupture of membranes; (4) Nutritional factors causing structural defects weakening its strength and elasticity [3].

### 4.2. Treatment of PROM

Before reaching full-term, fetal membranes can break prematurely causing a series of complications to the mother and infant. Once detected, bed rest, avoiding unnecessary vaginal examinations, promoting fetal lung maturity and rational use of tocolytic agents and antibiotics should be prescribed. For pregnant women with vaginal tract infections at risk of PPRM, bacterial culture of vaginal secretions is required before prescribing antibiotics. If the culture is negative, broad spectrum antibiotics such as penicillin should be used to prevent antibiotic prophylaxis.

#### 4.2.1. Application of antibiotic

The use of antibiotics in pregnant women with PROM can reduce the infection rate of pregnant women and newborns, effectively prolonging gestational period, reducing the incidence of neonatal respiratory distress syndrome, cerebral hemorrhage, necrotizing enteritis, and ultimately achieving the purpose of improving neonatal outcome. Antibiotics were chosen according to the results of vaginal culture.

Vaginal fluid can be used to diagnose clinical symptoms of PROM; however, diagnosis is often difficult so it can be combined with fetal fibronectin (fFN). Prediction of fetal fibronectin premature sensitivity was 50%. Its specificity

was 80–90% with no delivery within one week of negative prediction value of 98%, two weeks regardless of Wan was 95%. Principle treatment is in fetal survival with no obvious deformity, no obvious paper wool chorioamnionitis, no serious pregnancy complications, Palace mouth opening at 2 cm, and positive preterm delivery prediction. Gestational period should be extended to prevent premature birth but if it is unavoidable, neonatal survival rate should be improved. However, there are still difficulties in the treatment of PROM, especially for PPRM and it should be extended to reduce serious complications in the development of the newborn. Therefore, the choice of the timing of delivery is very important to the mother and child [4].

#### 4.2.2. The application of tocolytics

Non-full-term early breakage of the fetal membrane after the occurrence of PROM is frequently inevitable and tocolytics were usually considered to prolong gestational weeks. Common tocolytics used are salbutamol sulfate and magnesium sulfate. However, the condition of the fetus must be considered as the main purpose of tocolytics is to prevent preterm labor. At less than 34 weeks of gestation and if the palace mouth opening is less than 2 cm, magnesium sulfate was prescribed. Perinatal survival rate was improved with a 28% miscarriage rate. After the diagnosis of PPRM, tocolytics should immediately be used without waiting for uterine contraction. Close monitoring of the womb while weighing the pros and cons before terminating pregnancy would improve neonatal survival rate.

#### 4.2.3. To promote fetal lung maturation

Treatment of PPRM to promote fetal lung maturation is of great significance for neonatal prognosis. Commonly used drugs are glucocorticoids such as betamethasone and dexamethasone. At present, the main application of glucocorticoid is for pregnant women at 28–36 + 6 weeks of pregnancy with a risk of premature delivery. When the gestational week is more than 34 weeks, neonatal respiratory distress syndrome (NRDS) and intraventricular hemorrhage (IVH) incidence is relatively low and medication after neonatal outcome has not improved. Treatments of glucocorticoids should be used on women at 28–34 weeks

of pregnancy and within 7 days of preterm labor; 12 mg betamethasone intramuscular injection once a day, for a total of 2 times, or intramuscular injections of 6 mg dexamethasone within 12 hours, for 4 times.

### 4.3. Mode of delivery

At 28–32 weeks of pregnancy, fetal lungs have a certain degree of maturity. It has been reported that after 28 weeks of gestation, neonatal survival rate could reach more than 80% via vaginal delivery due to the small fetal size. However, due to immature fetal organ development and the difference in the tolerance of uterine pressure, the fetus is prone to intrauterine hypoxia and neonatal asphyxia. Moreover, fetal skull ossification is incomplete thus vaginal delivery could induce intracranial hemorrhage, so the mode of delivery should be fully considered. At 32 to 34 weeks, fetal development has achieved good maturity and vaginal childbirth harm significantly lowered than for those before 32 weeks of pregnancy and is more than or equal to 35 weeks of gestation. Fetal maturity and neonatal complications are almost similar with full-term pregnancy, so the choice of delivery mode can be chosen according to the principles of full-term pregnancy [5,6].

### 5. Conclusion

In short, routine vaginal discharge examination should be done to prevent PROM to newborn infants. There are certain factors to consider for women with PPRM. Pregnant women with abnormal pregnancy age, especially in patients with habitual abortion and premature birth, should be treated with routine color Doppler ultrasound examinations and any uterine malformation should be observed should there be a need for surgical treatment, in order to prevent the occurrence of PPRM and habitual

abortion. For lower genital tract infections, discovery of increased vaginal discharge, itching, odor and other symptoms should be immediately reported for active treatment of genital tract infections, as well as abstaining from sexual intercourse. Pregnant women should observe a reasonable diet with attention to foods rich in vitamin C, zinc, copper and protein. For PPRM patients, infections should be actively prevented, uterine contraction inhibited, as well preventing miscarriage by using glucocorticoids to promote fetal lung maturation and reduce the incidence of neonatal lung disease. However, with continuous reduction of amniotic fluids, intrauterine infections, fetal distress and other conditions, pregnancy should be immediately terminated in order to improve pregnancy outcome.

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