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Special Case Report of Pregnancy 28-30 Weeks Gestation with Premature Rupture of Membranes

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ABSTRACT

Background: Premature rupture of membranes (PROM) can be defined as a rupture of the membranes before delivery that can occur at any gestational age. PROM can occur at gestational age before 37 weeks or after 37 weeks. The incidence of PROM ranges from 8-10% of all pregnancies. Management decisions depend on gestational age and evaluation of the relative risks of delivery versus the risks of expectant management when pregnancy is allowed to progress to a later gestational age.
Case presentation: Patient with pregnancy at 28 – 30 weeks gestation. The patient came to the ER of General Hospital with complaints of watery discharge for 4 hours since admission to the hospital. The water comes out a lot of clear white, odorless, and with no uterine bleeding.
Conclusion: The inpatient management of patients with premature rupture of membranes is found to be an acceptable option in the case of the pregnant woman and fetus stable state.

Keywords: premature rupture of membrane, pregnancy, gestational age

INTRODUCTION

Premature rupture of membranes (PROM) can be defined as a rupture of the membranes before delivery that can occur at any gestational age. PROM can occur at gestational age before 37 weeks which is called Preterm Premature Rupture of Membrane (PPROM) or after 37 weeks which is called Premature Rupture of Membrane (PROM). PROM is still a problem in the field of obstetrics. The incidence of PROM ranges from 8-10% of all pregnancies. In term pregnancy the incidence varies between 6-19% while in preterm pregnancy the incidence is 2% of all pregnancies. PROM is a condition that still occurs in both developed and developing countries and poses a serious threat to the welfare of the mother and fetus if not managed properly. Some causes of PROM include ascending infection from the vagina, antepartum bleeding, trauma to the abdomen, cervical insufficiency, and invasive procedures such as amniocentesis. Several risk factors of the premature rupture of membranes were identified. One of them is the intrauterine infectious process. Low social and economic status, harmful habits (tobacco smoking and drugs), low body mass index (less than 19.8 kg/m2), as well as insufficient food consumption are predisposing to PROM. The PROM risk is significantly higher with women, who experienced premature rupture of membranes during a previous pregnancy. However, in most cases the PROM occur without any predisposing factors.

PROM is associated with complications of preterm birth and the occurrence of infectious chorioamnionitis so that it can become sepsis which increases perinatal morbidity and mortality. PROM in preterm pregnancy has the most significant risk of complications of prematurity, the most reported of which is respiratory distress. Preterm PROM with intrauterine inflammation has also been associated with an increased risk of neurodevelopmental disorders. Maternal chorioamnionitis after preterm PROM is associated with a higher risk for neonatal sepsis followed by prolonged oligo/anhydramnios which can lead to bronchopulmonary dysplasia (BPD) with perinatal mortality of up to 80%.

Management decisions depend on gestational age and evaluation of the relative risks of delivery versus the risks (e.g., infection, abruptio placentae, and umbilical cordaccident) of expectant management when pregnancy is allowed to progress to a later gestational age. An accurate assessment of gestational age and knowledge of the maternal, fetal, and neonatal risks are essential to appropriate evaluation, counseling, and care of patients with PROM. Conservative management is chosen in PPROM until the fetus is viable, consist of hospitalization, assessment of sign of infection, well-being of the fetal and maternal. Until now the management used is the administration of antibiotics to maintain pregnancy, reduce maternal and infant infections, and reduce maternal and infant morbidity. In addition, corticosteroid administration is also beneficial in lung maturation and reduces neonatal mortality, respiratory distress syndrome, and intraventricular hemorrhage. Tocolytic administration in preterm PROM is also considered beneficial. Tocolytics are used to inhibit uterine contractions and delay labour. In our article we present the description of the case of pregnancy at PROM at 28 - 30 weeks of pregnancy under inpatient management.

CASE REPORT

A 31-year-old Indonesian primigravida at 28-30 weeks of pregnancy presented to the hospital with chief complaints of watery fluid wetting her undergarment regularly since 4 hours before admission to the hospital, with no uterine contractions or bleeding.

The patient had normal blood pressure (122/793 mmHg) and a good general health status, with no fever (36.5 C), respiratory rate 20 times/ minutes, heart rate 108 beats/minutes. On per abdomen examination-size of uterus was corresponding to the period of amenorrhoea and normal fetal heart sound was audible. On speculum examination pooling of amniotic fluid from the cervical ostium was visualized and pH paper test was used to confirm the diagnosis of premature rupture of membrane. She was having regular menstrual period with 3 - 5 days bleeding; with 28 days cycle, had her last menstrual period seven months ago. The gestational age was estimated as 28-30 weeks days by ultrasonic fetal biometry. Abdominal ultrasound showed the fetus in cephalic position with cardiac activity and active fetal movements, a normally inserted placenta on the upper anterior side, and a normal amount of amniotic fluid (AFI 5,1 cm). The fetus weight estimated by the Hadlock formula was 2480 g, fetal heart rate is 144 beats/minutes.

During her hospital stay routine blood (complete blood count) and urine examination was done and the reports were normal; she was evaluated for presence of infection by CRP test every alternate day—it was negative every time. On laboratory investigation: Blood group was “A” Rhesus-Positive, Hb was 11.8 gm/dL (Normal range: 12 - 16 g/dL), Hematocrit was 32,50% (Normal range: 36% - 47%), WBC was 9600/µL (Normal range: 4000-10,000/µL), Platelet count was 220,000 / µL (Normal range:150,000-350,000/µL), bleeding time 2.0 minutes, clotting time 12,0 minutes, CRP (C-Reactive Protein) was negative every time.

On urine examination: Color was yellow, Transparency was clear, Bacterial sugar was

Negative, Ketone bodies was Negative, Urine specific gravity was 1.018 (Normal range: 1.003 - 1.030), Acidity/Alkalinity (pH) was 6.0 (Normal range: 4.5 - 8.0), Occult blood was Negative, Leucocyte esterase was (+) 2-3 cells.

She was explained about the risks and benefits of active and expectant management. She was given injection Ampicillin 2 mg and injection Erythromycin 500 mg, intravenously, 6 hourly for 2 days followed by Amoxycillin 500 mg and Erythromycin 250 mg 8 hourly, orally for 7 days, dexamethasone intramuscular 6 mg every 12 hours for 2 days cover to mature the fetal lungs for the prevention of respiratory distress syndrome, MgSO4 6 gr IV bolus for 20 minutes then 2 gr/ hours up to 12 hours, and a planning of amnioinfusion.

She was kept under observation. She was absolutely free of leaking and was discharged after 10 days of her hospital stay. On discharge she was advised to maintain pelvic rest and keep herself at ease. This patient being aware of the risk of preterm delivery, she was following the advice properly, as she said in her subsequent antenatal visit.

DISCUSSION

Prelabor rupture of membranes is rupture of membranes before the onset of labor. Membrane rupture before labor that occurs before 37 weeks of gestation is referred to as "preterm prelabor rupture of membranes." Management of preterm and term PROM is influenced by gestational age and the presence of complicating factors such as clinical infection, abruptio placentae, labor, or abnormal fetal testing. An accurate assessment of gestational age and knowledge of the maternal, fetal, and neonatal risks are essential to appropriate evaluation, counseling, and care of patients with PROM. The etiology of PROM remains unclear, but a variety of factors are purported to contribute to its occurrence, including vaginal and cervical infections, abnormal membrane physiology (apoptosis secondary to oxidative stress), incompetent cervix, and nutritional deficiencies.

Most case of PROM can be diagnosed on the basis of the patient history and physical examination. Examination should be performed in a manner that minimizes the risk of infection. The diagnosis of membrane rupture typically can be confirmed by sterile speculum examination, nitrazine test, arborization (ferning test). Ultrasonographic examination of amniotic fluid volume may be a useful adjunct but is not diagnostic. Ultrasonographic definition of oligohydramnios has been standardized. Objective criteria include measurement of the vertical axis of amniotic fluid present in four quadrants, the total being called the amniotic fluid index (AFI). A value of less than 5 cm is considered abnormal.

Administration of broad-spectrum antibiotics prolongs pregnancy, reduces maternal and neonatal infections, and reduces gestational age-dependent morbidity. The optimal antibiotic regimen is unclear because multiple regimens have demonstrated benefit.

Based on available information, a 7-day course of therapy of latency antibiotics with a combination of intravenous ampicillin and erythromycin followed by oral amoxicillin and erythromycin is recommended during expectant management of women with preterm PROM who are at less than 34 0/7 weeks of gestation.

The regimen used in the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network trial was intravenous ampicillin (2 g every 6 hours) and erythromycin (250 mg every 6 hours) for 48 hours followed by oral amoxicillin (250 mg every 8 hours) and erythromycin base (333 mg every 8 hours).

Some centers have replaced the use of erythromycin with azithromycin (such as a single oral dose of azithromycin 1 g) in situations in which erythromycin is not available or not tolerated, and this substitution is a suitable alternative.

The antibiotic of choice and optimal duration of treatment are not clear; erythromycin 250 mg four times a day for 10 days or until the woman is in established labour (whichever is sooner), is recommended in NG25. Penicillin may be used in women who cannot tolerate erythromycin.

The use of antenatal corticosteroids after preterm PROM has been evaluated in a number of clinical trials and has been shown to reduce neonatal mortality, respiratory distress syndrome, intraventricular hemorrhage, and necrotizing enterocolitis. A single course of corticosteroids is recommended for pregnant women between 34 0/7 weeks of gestation and 36 6/7 weeks of gestation at risk of preterm birth within 7 days and who have not received a previous course of antenatal corticosteroids if proceeding with induction or delivery in no less than 24 hours and no more than 7 days.

Steroid therapy is only effective in preventing respiratory disorders in newborns born within 14 days after dose administration, and repeated administration of steroids during pregnancy does not improve neonatal outcomes. For this reason, steroid therapy should be initiated only in those patients who are likely to give birth within two weeks of the start of the therapy.

A course of steroid therapy with betamethasone 12 mg given twice 24 h apart or Dexamethasone 6 mg four doses in 12 h apart i.m. should be given before 35 + 6 weeks of pregnancy to promote maturation of fetal lungs.

The use of tocolytic therapy was associated with a longer latency period and a lower risk of delivery within 48 hours but also was associated with a higher risk of chorioamnionitis in pregnancies before 34 0/7 weeks of gestation.

Tocolytic agents can be considered in preterm PROM for steroid benefit to the neonate, especially at earlier gestational ages, or for maternal transport but should be used cautiously and avoided if there is evidence of infection or abruption. Tocolytic therapy is not recommended in the setting of preterm PROM between 34 0/7 weeks of gestation and 36 6/7 weeks of gestation.

The most used tocolytics agents are magnesium sulphate and (MgSO4) and nifedipine. Magnesium sulphate (MgSO4) in obstetrics, can be used as a tocolytic, anticonvulsant in the treatment of preeclampsia, and is thought to act as neuroprotection against the fetal brain. Ionic magnesium in a suficiently high concentration can decrease myometrial contractility. It functions as a calcium antagonist, and when given in pharmacological doses, it may inhibit labor. The American Congress Of Obstetricians and Gynecologists (ACOG) recommends MgSO4 as a neuroprotectan in fetuses at less than 32 weeks gestation who are thought to be at risk of imminent delivery. Magnesium sulfate was given as a 6 gr bolus over 20 to 30 minutes and was followed with a maintenance infusion of 2 gr/hr. Magnesium sulfate was actually infusing at the time of delivery in approximately half of the treated women. Infusion continuation protocols vary by institution, including ours. In the BEAM study, after 12 hours with no signs of imminent delivery, the infusion was stopped and resumed if delivery again seemed imminent. If >6 hours had passed since discontinuation, another loading dose was given.

Nifedipine is a calcium antagonist or calcium channel blocker (CCB). Nifedipine works by inhibiting the entry of calcium into smooth muscle cell membranes, preventing the release of calcium from the sarcoplasmic reticulum and reducing the effect of intracellular calcium enzymes on actinmyosin interactions so that it can inhibit myometrial contractions. Based on several studies, nifedipine can be used as a first-line tocolytic in preterm labor by reducing the risk of labor within 7 days after initiation of treatment and delivery before 34 weeks with improvement in neonates. The initial dose of nifedipine for tocolytics is 10 mg sublingually every 15 minutes for the first 1 hour. The goal of low doses is to achieve a reduction in uterine contractions while

minimizing the side effects of nifedipine such as headache (most commonly and hypotension as a result of vasodilation. The maintenance dose is 20 mg every 6-8 hours given orally.

Amnioinfusion refers to the instillation of fluid into the amniotic cavity. Augmenting amniotic fluid volume may decrease problems associated with a severe reduction or absence of amniotic fluid in PROM, thus improving neonatal outcomes. Oligohydramnios associated with PROM in the fetus may lead to the development of pulmonary hypoplasia. Factors that may be responsible include fetal crowding with thoracic compression, restriction of fetal breathing, and disturbances of pulmonary fluid production and flow. The duration of membrane rupture is an important consideration. Constraints placed on fetal movements in utero can also result in a variety of positional skeletal abnormalities, such as talipes equinovarus.

CONCLUSION

Management of preterm and term PROM is influenced by gestational age and the presence of complicating factors such as clinical infection, abruptio placentae, labor, or abnormal fetal testing. An accurate assessment of gestational age and knowledge of the maternal, fetal, and neonatal risks are essential to appropriate evaluation, counseling, and care of patients with PROM. The inpatient management of patients with premature rupture of membranes is found to be an acceptable option in the case of the pregnant woman and fetus stable state.

Declaration by Authors

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