Mini Review Article

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Membrane Rupture in Preterm Infants: Diagnosis and Treatment

Abstract

Preterm premature membrane rupture, often known as PMMR, occurs before 37 weeks of pregnancy. It happens in 3% of pregnancies and is the reason for about one-third of premature births. Significant perinatal morbidity, such as foetal death, placental abruption, umbilical cord prolapse, neonatal sepsis, respiratory distress syndrome, and neonatal sepsis, can result from it. Improving newborn outcomes depends on appropriate evaluation and management. Digital inspection is associated with a shorter latent period and the possibility of unfavourable consequences; hence speculum examination is used to detect cervical dilatation. Treatment varies based on gestational age and takes delivery into account when membrane rupture occurs at or after 34 weeks of pregnancy. Numerous neonatal problems, including intraventricular haemorrhage and respiratory distress, might be decreased by corticosteroids.

Keywords: Premature membrane rupture • Placental abruption • Umbilical cord prolapse • Neonatal sepsis • Cervical dilatation

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Introduction

Remature Rupture of Membranes (PROM) is when labour begins before the foetal membranes have ruptured. The majority of the time, this happens close to term, however preterm PROM is the name for when it happens before 37 weeks of pregnancy. A third of premature deliveries result from preterm PROM, which affects about 3% of pregnancies. It increases the chance of prematurity, causes a number of perinatal and neonatal problems, and raises the possibility of foetal death by 1 to 2 percent. Preterm PROM should be managed by doctors who treat pregnant patients because early diagnosis and effective treatment can lead to better outcomes [1].

Complications

Early delivery is one of preterm PROM's most frequent side effects. The latent period, or the interval between membrane rupture and delivery, is typically inversely correlated with the gestational age at which PROM takes place. An analysis of studies 4 evaluating patients with preterm PROM between 16 and 26 weeks' gestation found that 57% of patients delivered within one week, and 22% had a latent period of four weeks. For instance, one large study 3 of patients at term found that 95% of patients delivered within about one day of PROM. The consequences of PROM might include malpresentation, cord compression, oligohydramnios, necrotizing enterocolitis, cognitive impairment, intraventricular haemorrhage, and respiratory distress syndrome in surviving infants [2, 3].

Pathophysiology

Pre-term PROM is connected with a number of risk factors. Preterm PROM is more likely to occur in black people than in white patients. 11 Other individuals who are more at risk are those with a lower socioeconomic status, smoking habits, a history of STDs, past preterm births, vaginal haemorrhage, or uterine distension (such as polyhydramnios, multifetal pregnancy). Amniocentesis and cerclage are two procedures that could cause premature PROM. There doesn't seem to be a single cause of premature PROM. Preterm PROM may result from choriodecidual infection or inflammation. According to certain theories, patients are more likely to experience preterm PROM if their membranes' collagen level decreases. Numerous factors may put some people at risk for preterm PROM [4].

Diagnosis

A comprehensive history, physical examination, and chosen laboratory tests are necessary for the diagnosis of PROM. Patients frequently describe a sudden surge of fluid with ongoing

leaks. Physicians should inquire if the patient is feverish, contracting, ovulating, or bleeding vaginally. The patient's expected due date must be confirmed because it will guide any additional treatment. A speculum examination should be done by the doctor to check for cervical dilatation and effacement. It is crucial to refrain from performing a digital cervical check when preterm PROM is suspected because such exams have been demonstrated to raise morbidity and death. The presence of contaminating substances, such as blood, semen, or alkaline antiseptics, can also cause nitrazine paper to turn blue and produce a false-positive result. Nitrazine paper will turn blue when the pH is above 6.0. A similar outcome can be obtained from bacterial vaginosis [5].

To collect fluid from the posterior fornix or vaginal sidewalls, a different swab should be utilised. The doctor can use a low-power microscope to look for ferning (arborization) after the fluid has dried on the slide. If there is ferning, PROM is present. The presence of ferns may be obscured by vaginal blood, and if the external cervical os has been swabbed, cervical mucus may cause a false-positive result [6].

Treatment

Antibiotics treatment

Antibiotics can lengthen the latent period and minimise newborn infections in patients with preterm PROM. According to a meta-analysis 2, post-preterm PROM patients who received antibiotics had lower rates of postpartum endometritis, chorioamnionitis, neonatal sepsis, neonatal pneumonia, and intraventricular haemorrhage than those who did not get antibiotics. A decrease in infant intraventricular haemorrhage and sepsis was discovered by another meta-analysis. After preterm PROM, a multitude of antibiotic regimens are advised. In the protocol tested by the National Institute of Child Health and Human Development trial 25, 2 grammes of ampicillin and 250 mg of erythromycin are administered intravenously every six hours for 48 hours, then 250 mg of amoxicillin and 333 mg of erythromycin are administered every eight hours for five days [7, 8].

Tocolytic therapy

Only a small amount of information is available to decide whether tocolytic therapy is necessary following preterm PROM. As previously mentioned, corticosteroids and antibiotics are helpful when given to patients with preterm PROM, but there are no trials that compare these treatments with tocolysis. Although tocolytic medication may temporarily extend the latent period, it does not seem to have any positive effects on newborn outcomes. Although it is debatable, administering a brief course of tocolysis after preterm PROM to enable the start of antibiotics, corticosteroid therapy, and maternal transport is reasonable in the lack of data. In individuals with PROM, long-term tocolytic therapy is not advised; further investigation should be done before taking this into consideration [9, 10].

Conclusion

A perinatologist or neonatologist may be consulted by doctors caring for patients with preterm PROM before viability. If these individuals are stable, transporting them to a tertiary facility may be beneficial. It is debatable how patients with preterm PROM should be managed at home. Only 18% of preterm PROM patients in a study33 who were randomised to home management versus hospital management met the requirements for safe home management. Patients without signs of infection or active labour may be allowed to stay in bed at home before viability, but they must be thoroughly educated on the signs of infection and preterm labour, and doctors should think about consulting with specialists skilled in managing preterm labour at home.

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