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Original Research Article

An Observational Assessment of the Incidence of Premature Rupture of Membranes and its Effect on Prenatal & Maternal Morbidity and Mortality

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Abstract

Objective: To assess the maternal morbidity and perinatal outcome in pre-term/ pre-mature rupture of membranes between 24 to 37 weeks gestation.

Methods: This observational study was carried out in Department of Obstetrics and Gynecology, Mahila Chikitsalaya, Sawai Man Singh Medical College, Jaipur, Rajasthan, India. over a period of 14 months.

Results: This study was conducted on 175 patients. Of this most patients 98 belonged to poor class, 32 belonged to middle class and upper class accounted for 14 patients. Fetal outcome in 31 cases of preterm premature rupture of membrane revealed prematurity in 7 cases, fetal distress in 6 cases, cord compression in 3 cases, necrotizing enterocolitis in 1 cases, hypoxia in 13 cases and pulmonary hypoplasia in 3 cases.

Conclusion: Low socioeconomic status is associated with increased neonatal morbidity due to fetal distress, cord compression, necrotizing enterocolitis, hypoxia and pulmonary hypoplasia at the time of delivery. An appropriate and accurate diagnosis of PROM is critical to optimize pregnancy outcome. It is suggested that the timely diagnosis and management of preterm PROM will allow obstetric care providers to optimize perinatal outcome and minimize neonatal morbidity.

Keywords: Maternal Morbidity, Perinatal Morbidity, PPROM.

Introduction

Preterm premature rupture of the membranes (PPROM) is defined as loss of amniotic fluid before the onset of labor in pregnancies before 37 weeks of gestation, which is characterized as a painless flow of fluid that escapes out of the vagina [1].

PROM is linked to significant maternal and fetal morbidity and mortality. It has been shown to be the cause of 18%–20% and

21.4% of prenatal mortalities and morbidity respectively.[2, 3]The three causes of fetal death associated with PROM are sepsis, asphyxia, and pulmonary hyperplasia. Women with intrauterine infection deliver earlier than non-infected women, and infants born with sepsis have a mortality rate four times higher than those without sepsis do.[4]

The burden of PPROM ranges from maternal and neonatal mortality and morbidity to countrywide economic loss due to drug expense, hospitalization, absenteeism from the work, and expense to the health professionals [5]. PPROM is the primary cause of preterm deliveries and responsible for one-third of preterm births and 90% of neonatal death [6]. It also increases the risk for neonatal resuscitation, intraventricular hemorrhage, infection, and respiratory distress syndrome [7, 8].

Evidence suggests that the rupture of membrane is related to infection,[9] membrane dysfunction on a molecular level,[10] collagen destruction, and programmed cell death in fetal membranes.[11, 12]The complication risk of PROM is increased if the mother has previous PROM,low body mass index, concomitant infection of the gestational tissues, and longer the time elapsed between the rupture and delivery.[13]

PROM has essential significance for the further fate of pregnancy. Late diagnosis means wasted opportunity of appropriate intervention. In most cases, the diagnostics does not cause bigger problems, but in some situations it may not be easy to make the right diagnosis.[14]

The aim of this study was to evaluate the maternal and prenatal complications in pre-term pre mature rupture of membranes between 24 to 37 weeks gestation.

Methods:

This observational study was carried out in Department of Obstetrics and Gynaecology, Mahila chikitsalaya, Sawai Man Singh Medical College, Jaipur, Rajasthan, India. over a period of 14 months.

Inclusion criteria

Patients with gestational age between 24 to 37 weeks with preterm premature rupture of membrane (PPROM) confirmed by ultrasound and clinical examination were included regardless of their age.

Exclusion criteria

Patients with congenital anomalies, multiple pregnancy, pre-eclampsia & eclampsia, diabetes mellitus, polyhydramnios, intrauterine growth restriction and placental abruption.

Methodology

To collect data proforma was filled in all cases. After admission, detailed workup including history, general physical examination, abdomen and pelvic examination and relevant /specific investigations were noted.

Data were analyzed through SPSS software version 16. This study was initiated after taking permission from ethical review committee (ERC).

Results:

This study was conducted on 175 patients. Of this most patients 98 belonged to poor class, 32 belonged to middle class and upper class accounted for 14 patients.

Fetal outcome in 31 cases of preterm premature rupture of membrane revealed prematurity in 7 cases, fetal distress in 6 cases, cord compression in 3 cases, necrotizing enterocolitis in 1 cases, hypoxia in 13 cases and pulmonary hypoplasia in 3 cases.

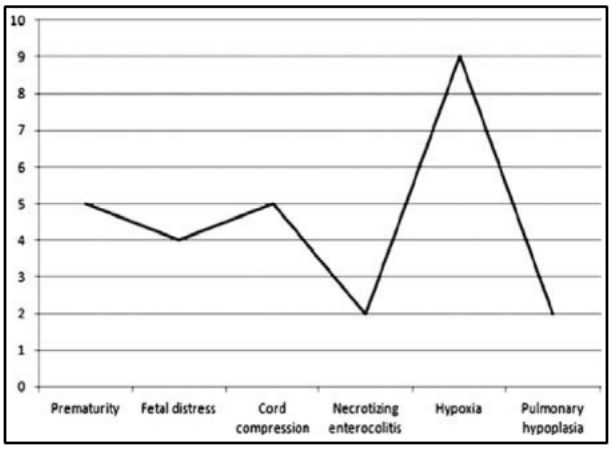

Figure 1: Fetal outcome.

Figure1: Maternal morbidity & perinatal outcome in PPRM

Discussion:

Premature rupture of membranes is a fairly common complication of pregnancy and can lead to increased maternal complications, operative procedures, neonatal morbidity and mortality. Prelabor rupture of the membranes occurs in 2% of all births and 40% of all preterm births.[15-17]

Mothers with a duration of PROM greater than or equal to 12 hours were more likely to experience unfavorable outcome than those with a duration of PROM less than 12 hours. This finding corroborates the results of studies conducted in Karnataka and India.[18, 19]

UTI during pregnancy was significantly associated with the development of PPROM. This finding was consistent with the study performed by Singh et al. [20]. Elevations of inflammatory mediators such as prostaglandins, cytokines, and proteinases in the local tissue play a causative role in disruption of fetal membrane integrity and in triggering uterine contractility. (They are produced as a part of physiologic maternal defense mechanism in response to pathogens' invasion. (The inflammatory mediators and production of matrix degrading enzymes and TNFs are involved in mechanisms of PPROM [21].

PROM is associated with significant maternal, fetal and neonatal risks. A number of studies have demonstrated that PROM may be strongly associated with the subsequent development of adverse neonatal outcomes such as neonatal death, PVL, PIVH, cerebral palsy and bronchopulmonary dysplasia [22-24], especially among children of women who develop chorioamnionitis after PROM.

Reports from Saudi Arabia showed that the incidence of neonatal mortality was 5.5%, respiratory distress was 15.9%, neonatal sepsis was 7.7% and necrotizing enterocolitis was 3.1% in patients with PROM [25], while results from France showed the incidences of neonatal mortality to be 11.7%, neonatal sepsis 15%, bronchopulmonary dysplasia 8.4% and cerebral injury 11.7% in cases with PPROM between 24 and 34 weeks gestation [26].Everest et al. [27] found that most live born infants required neonatal intensive care, including mechanical ventilation (78%), if membrane rupture occurred before 24 weeks'

gestation and had a latent period of 14 days' duration.

The incidence of fetal and neonatal infectious diseases was increased. The incidence was 31.3% in the current study. PROM has also been shown to increase the incidence of intrauterine infection, and Tiufekchieva [28]found that there was a strong relationship between inflammatory changes in the fetal membranes, cord and placenta and the occurrence of neonatal infections.

Patients with preterm PROM the most likely outcome is preterm delivery within one week with its associated morbidity and mortality risk such as respiratory distress necrotizing enterocolitis, intra ventricular hemorrhage and sepsis. [29]. The incidence of neonatal infection for infants born to women with PROM range from 1–2.6%.[30]In many studies it was found that the risk of neonatal infection was increased among mother colonized with group B streptococci, premature rupture of membranes >18 hours maternal fever during labor and prematurity.[31]

There is accumulating evidence that in utero exposure to infection increases the risk of long-term neurologic sequel, although there are no current data to demonstrate that delivery before the onset of clinical symptoms of infection prevents these adverse outcomes.[32]

Conclusion:

It is concluded that there is low socioeconomic status which is associated with increased neonatal morbidity due to fetal distress, cord compression, necrotizing enterocolitis, hypoxia and pulmonary hypoplasia at the time of delivery. Hence, improved nutritional statuses of pregnant women, early screening, diagnosis, and quick treatments of UTI and abnormal vaginal discharges were recommended to decrease PPROM.

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