

Assessment of Premature Rupture of Membrane Characteristics and Outcome in a Known Population

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ABSTRACT

Background: Preterm pre-labor rupture of membranes (PPROM) occurs in 2–3% of all pregnancies and contributes to 30–40% of preterm births. The present study was conducted for assessing premature rupture of membrane characteristics and outcome in a known population. **Methods:** Confirmation of the diagnosis of premature rupture of membrane done on the basis of clinical and/or biological diagnostic procedures. A total of 100 women participants with premature rupture of membrane were included in the study group. Another set of 100 women participants with absence of premature rupture of membrane were taken as control group. A Performa was made and risk factors and outcome of premature rupture of membrane was recorded. All the results were recorded and were analysed by SPSS software. Chi-square test was used for assessment of level of significance. **Results:** Mean pre-pregnancy BMI, History of endometriosis, History of PPRM, History of prematurity and multiple pregnancies were found to be significant risk factors of premature rupture of membrane. Gestational diabetes mellitus, Infections treated by pregnancy and Exposure to tobacco smoke during pregnancy were also found to be significant risk factors for premature rupture of membrane. Oligohydramnios, Abruption placentae, Cesarean section, neonatal jaundice and still birth were found to be present in significantly higher proportion among patients of the study group in comparison to the patients of the control group. **Conclusion:** History of endometriosis, history of PPRM, history of prematurity and multiple pregnancies were found to be significant risk factors of premature rupture of membrane.

Keywords: Premature, Rupture, Membrane.

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INTRODUCTION

Preterm prelabor rupture of membranes (PPROM) occurs in 2–3% of all pregnancies and contributes to 30–40% of preterm births. PPRM is a multifactorial process including certain risk components such as PPRM in previous pregnancy, smoking, socioeconomic status, infection (bacterial vaginosis), amniocentesis, polyhydramnion, multiple gestation and vaginal bleeding. In many cases the cause of PPRM remains unknown. PPRM is initiated by membrane stretch and involves local inflammation and ascending bacterial colonisation.^[1-3]

Most studies on risk factors and outcomes of PPRM have been heterogeneous with regards to methodologies and the number of characteristics investigated, and only a few were prospective large-scale longitudinal cohorts. Management options are induction of labor, either immediately or in cases of severe oligohydramnios or chorioamnionitis, or

expectant management with antibiotics and with steroids once viability is reached. Most clinical guidelines state that with early PPRM, obstetric and pediatric teams must share a realistic and individualized appraisal of neonatal outcomes with parents and consider their wishes for all decisions.^[4-6] Hence; present study was conducted to assess premature rupture of membrane characteristics and outcome in a known population

MATERIALS & METHODS

The present study was commenced in the obstetrics and gynecology to assess premature rupture of membrane characteristics and outcome in a known population. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. Exclusion criteria for the present study included:

- Pregnant women without information on the occurrence of PPRM
- Pregnancies termination
- Miscarriage or fetal death before 22 weeks of gestation
- Incomplete follow-up

Confirmation of the diagnosis of premature rupture of membrane done on the basis of criteria previously

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described in the literature. According to these criteria, premature rupture of membrane was confirmed by clinical and/or biological diagnostic procedures which included

- The visualization of amniotic fluid passing from the cervical canal and pooling in the vagina,
- A basic pH test of vaginal fluid, or
- Arborization of dried vaginal fluid identified under microscopic evaluation.^[6]

A total of 100 women participants with premature rupture of membrane were included in the study group. Another set of 100 women participants with absence of premature rupture of membrane were taken as control group. A Performa was made and risk factors and outcome of premature rupture of membrane was recorded. All the results were recorded and were analysed by SPSS software. Chi-square test was used for assessment of level of significance.

RESULTS

In the present study, a total of 100 healthy controls and 100 subjects with premature rupture of membrane were enrolled. Mean age of the subjects of the study group and the control group was 29.7 and 28.6 years respectively. Mean BMI of the subjects of the study group and the control group was 19.3 and 23.7 Kg/m² respectively. History of endometriosis was found to be present in 2 percent of the patients of the control group and 7 percent of the patients of the study group. History of PPRM was found to be present in 1 percent of the patients of the control group and 6 percent of the patients of the study group. History of prematurity was found to be present in 5 percent of the patients of the control group and 16 percent of the patients of the study group. Multiple pregnancies were found to be present in 1 patient of the control group and 10 percent of the patients of the study group. Mean pre-pregnancy BMI, History of endometriosis, History of PPRM, History of prematurity and multiple pregnancies were found to be significant risk factors of premature rupture of membrane.

Table 1: Risk factors of premature rupture of membrane

Parameter	Control group	Study group	p- value
Mean age (years)	28.6	29.7	0.25
Mean pre-pregnancy BMI (Kg/m ²)	19.3	23.7	0.04*
History of endometriosis (%)	2	7	0.03*
History of PPRM (%)	1	6	0.00*
History of prematurity (%)	5	16	0.01*
Multiple pregnancies (%)	1	10	0.00*

*: Significant

In the present study, Gestational diabetes mellitus, Infections treated by pregnancy and Exposure to

tobacco smoke during pregnancy were also found to be significant risk factors for premature rupture of membrane. In the present study, Oligohydramnios, Abruption placentae, Cesarean section, neonatal jaundice and still birth were found to be present in significantly higher proportion among patients of the study group in comparison to the patients of the control group.

Table 2: Medical history and complications during pregnancy

Parameter	Control group	Study group	p- value
Hypertensive disorders of pregnancy (%)	4	5	0.29
Gestational diabetes mellitus (%)	6	14	0.00*
Infections treated by pregnancy (%)	18	30	0.01*
Exposure to tobacco smoke during pregnancy (%)	13	21	0.04*

*: Significant

Table 3: Outcome

Outcome	Control group	Study group	p- value
Oligohydramnios	3	9	0.00*
Abruption placentae	0	4	0.00*
Cesarean section	18	29	0.03*
Neonatal jaundice	19	42	0.01*
Still birth	0	2	0.00*

*: Significant

DISCUSSION

Premature rupture of the membranes (PROM) is usually defined as rupture of membranes at any time before the onset of uterine contractions. PROM which occurs prior to 37 weeks of gestation is referred as preterm premature rupture of membranes (PPROM), whereas; PROM which occurs after 37 weeks of gestation is referred as term premature rupture of membranes. The latent period is defined as the duration from rupture of the membranes until the onset of true labor.^[7-9]

In the present study, a total of 100 healthy controls and 100 subjects with premature rupture of membrane were enrolled. Multiple pregnancies were found to be present in 1 patient of the control group and 10 percent of the patients of the study group. Mean pre-pregnancy BMI, History of endometriosis, History of PPRM, History of prematurity and multiple pregnancies were found to be significant risk factors of premature rupture of membrane. Furman et al evaluated maternal characteristics and neonatal and maternal birth outcome in cases of prelabor rupture of membranes (PPROM) in a non-selected parturient population. The study population consisted of 5660 singleton preterm births (24-36 weeks gestation). A cross-sectional study was designed between two groups. The study group consisted of patients with PPRM (n=968) and the comparison group consisted of patients without PPRM (n=4692). Information was obtained using a

computerized database based on detailed obstetrical records. PPROM was associated with a significantly lower gestational age (24-32 weeks) and birth weight (<2500 g) than those with intact membranes. The rates of chorioamnionitis and urinary infection were found significantly higher in the PPROM group compared with women without PPROM (16.5 vs. 2.7%; 5.1 vs. 3.3%, respectively) ($P < 0.001$). The rate of endometritis and bacteremia in the postpartum period were significantly higher in women with PPROM compared with controls 2.8 vs. 1.4%, ($P = 0.003$) and 9.4 vs. 5%, ($P = 0.001$), respectively. Total perinatal mortality rates were significantly higher in the group without PPROM 10.5 vs. 7.2% ($P = 0.01$), however, rates of postpartum death were higher in the PPROM group 5.5 vs. 4% ($P < 0.01$). When adjusted for recognized risk factors using logistic regression analysis, infection of amniotic fluid ($OR = 6.6$) and genitourinary tract infection ($OR = 1.64$) remained the independent risk factors associated with PPROM. Infectious morbidity in patients with preterm prelabor rupture of membranes and preterm delivery remained an important risk factor for obstetrical and neonatal complications.^[10]

In the present study, Gestational diabetes mellitus, Infections treated by pregnancy and Exposure to tobacco smoke during pregnancy were also found to be significant risk factors for premature rupture of membrane. In the present study, Oligohydramnios, Abruptio placentae, Cesarean section, neonatal jaundice and still birth were found to be present in significantly higher proportion among patients of the study group in comparison to the patients of the control group. Hanke K et al evaluated the independent effect of preterm prelabor rupture of membranes (PPROM) as a cause of preterm delivery on mortality during primary hospital stay and significant morbidities in very-low-birth-weight (VLBW) infants < 32 weeks of gestation. 6102 VLBW infants were enrolled in GNN from 2009-2012, $n = 4120$ fulfilled criteria for primary analysis (< 32 gestational weeks, no pre-eclampsia, HELLP (highly elevated liver enzymes and low platelets syndrome) or placental abruption as cause of preterm birth). Multivariable logistic regression analyses included PPROM as potential risk factors for adverse outcomes and well established items such as gestational age in weeks, birth weight, antenatal steroids, center, inborn delivery, multiple birth, gender and being small-for-gestational-age. PPROM as cause of preterm delivery had no independent effect on the risk of early-onset sepsis, clinical sepsis and blood-culture proven sepsis, while gestational age proved to be the most important contributor to sepsis risk. The diagnosis of PPROM was associated with an increased risk for bronchopulmonary dysplasia (BPD; $OR: 1.25$, 95% $CI: 1.02-1.55$, $p = 0.03$) but not with other major outcomes. The diagnosis of PPROM per se is not associated with

adverse outcome in VLBW infants < 32 weeks apart from a moderately increased risk for BPD.^[11]

CONCLUSION

From the above results, the authors concluded that positive history of endometriosis, history of PPROM, history of prematurity and multiple pregnancies were found to be significant risk factors of premature rupture of membrane. Gestational diabetes mellitus, Infections treated by pregnancy and Exposure to tobacco smoke during pregnancy were also found to be significant risk factors for premature rupture of membrane.

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