



Predictors of neonatal outcome in preterm premature rupture of membranes after cervical cerclage

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Objective

To evaluate the risk factors associated with neonatal outcome in pregnant women with preterm premature rupture of membranes (PPROM) after cervical cerclage.

Methods

This was a retrospective cohort study of singleton pregnancies with cervical insufficiency at a tertiary referral center from 2000 to 2017. The risk factors associated with neonatal outcome were investigated in these pregnant women, complicated with PPRM after cervical cerclage.

Results

Eight hundred and seventy-one cases were initially diagnosed with cervical insufficiency and underwent cerclage during this period, of which 120 (13.78%) were complicated with PPRM subsequently. After excluding cases that did not meet the study criteria, 110 pregnancies were recruited for analysis. Mothers with a higher white blood cell (WBC) count, a higher C-reactive protein (CRP) level, a lower amniotic fluid index (AFI), and chorioamnionitis were significantly associated with earlier delivery gestational ages, lower birth weights and lower neonatal Apgar scores. In addition, a higher WBC count was related to neonatal sepsis ($P=0.004$); a higher CRP level was related to higher incidences of neonatal respiratory distress syndrome (RDS) ($P=0.030$) and retinopathy ($P=0.024$); cerclage retention over 12 hours after PPRM was related to higher neonatal RDS ($P=0.043$) and neonatal intensive care unit admission rates ($P=0.003$). Furthermore, logistic regression analysis showed that neonatal mortality was significantly related to oligohydramnios (adjusted OR 2.978, 95% CI 1.107-8.010, $P=0.031$) and chorioamnionitis (adjusted OR 3.166, 95% CI 1.034-9.690, $P=0.043$). Using ROC curve analysis, the cut-off value of AFI correlated with a lower neonatal mortality was 5.05 cm.

Conclusion

Oligohydramnios and chorioamnionitis are strongly associated with neonatal mortality. Maternal WBC count, CRP level and AFI provide valuable information for the management of PPRM after cervical cerclage.

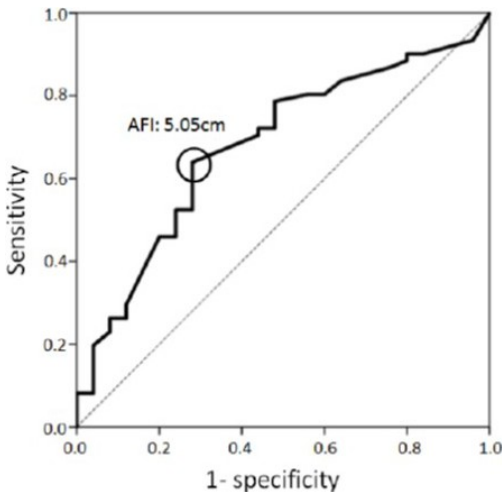


Table. Relationships between Maternal Risk Factors and Neonatal Outcomes

| | WBC | | CRP | | AFI | | Chorioamnionitis | | Cerclage retention (> 12 hours) | | PPROM to delivery latency | |
|---------------------|---------------|-----------------|---------------|-----------------|--------------|-----------------|------------------|-------------|---------------------------------|-------------|---------------------------|-------------|
| | CC | P | CC | P | CC | P | CC | P | CC | P | CC | P |
| GA at delivery | -0.339 | <.001 | -0.446 | <.001 | .450 | <.001 | -0.318 | .001 | .011 | .909 | .170 | .077 |
| Birth weight (g) | -0.311 | .001 | -0.444 | <.001 | .463 | <.001 | -0.308 | .001 | -.029 | .767 | .136 | .159 |
| Apgar score (1 min) | -0.293 | .002 | -0.342 | .002 | .336 | .002 | -0.318 | .001 | -.023 | .810 | .126 | .193 |
| Apgar score (5 min) | -0.310 | .001 | -0.346 | .002 | .401 | <.001 | -0.308 | .001 | -.031 | .753 | .100 | .303 |
| RDS | .142 | .141 | .245 | .030 | .009 | .931 | .091 | .345 | .195 | .043 | .153 | .113 |
| IVH | .052 | .588 | .166 | .143 | .001 | .995 | .007 | .939 | -.012 | .901 | .009 | .925 |
| PVL | -.025 | .798 | -.072 | .526 | .007 | .951 | -.095 | .324 | .054 | .575 | .007 | .941 |
| NEC | .055 | .570 | .084 | .460 | NA | NA | -.047 | .627 | -.122 | .208 | -.120 | .213 |
| Retinopathy | .002 | .981 | .253 | .024 | .087 | .428 | .082 | .396 | -.034 | .728 | -.001 | .994 |
| PDA | .058 | .552 | .064 | .577 | -.048 | .658 | -.060 | .535 | -.067 | .490 | -.083 | .391 |
| Hyperbilirubinemia | -.065 | .500 | .039 | .734 | .216 | .046 | .014 | .884 | .094 | .329 | .167 | .083 |
| Sepsis | .273 | .004 | .007 | .953 | -.064 | .555 | .003 | .974 | .075 | .438 | .109 | .261 |
| NICU admission | .102 | .295 | .088 | .444 | -.050 | .646 | .144 | .136 | .281 | .003 | .218 | .023 |
| Mortality | .210 | .029 | .205 | .070 | -.282 | .008 | .235 | .014 | .029 | .762 | -.084 | .385 |

GA: gestational age; RDS: respiratory distress syndrome; IVH: intraventricular hemorrhage; PVL: periventricular leukomalacia; NEC: necrotizing enterocolitis; PDA: patent ductus arteriosus; NICU: neonatal intensive care unit; WBC: white blood cell; CRP: C-reactive protein; AFI: amniotic fluid index; PPRM: preterm prelabor rupture of membranes; CC: correlation coefficient; NA: not applicable
 Bold indicates significant P values.