Association of abnormal vaginal colonization and preterm delivery: effect of cervical length

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**Background**

- Ascending migration of abnormal microorganisms from the female genital tract is considered to be the most important route of bacterial spread, leading to intrauterine infection in preterm gestation. However, the exact relationship between abnormal vaginal colonization and adverse pregnancy outcome in preterm labor (PTL) remains unclear. Therefore, we hypothesized that women with shorter cervical length (CL) are predisposed to ascending infection compared to those with longer CL in women with preterm labor or short CL.

**Objective**

- We aimed to examine abnormal vaginal colonization rate according to cervical shortening and also to compare the association between abnormal vaginal colonization and spontaneous preterm delivery (SPTD) before 34 weeks according to CL in women with preterm labor or short CL.

**Methods**

- This study included 580 patients who admitted to our high-risk unit due to PTL or short CL and underwent vaginal culture and measurement of CL at admission between 2005 and 2015. Maternal age, body mass index at admission, parity, vaginal culture result, CL at admission, birth weight of neonates, and delivery outcome including SPTD before 34 weeks were retrospectively reviewed. The study population was divided three groups according to the degree of cervical shortening: CL < 0.5cm (n=113), 0.5cm to 1.5cm (n=145), ≥ 1.5cm (n=322).

**Results**

- There was no difference in abnormal vaginal colonization rate according to the CL shortening (17.7%, 17.9%, 13.7% in group with CL < 0.5cm, 0.5cm to 1.5cm, ≥ 1.5cm, respectively, p=0.22 by linear by linear association). The rate of SPTD was not different according to the presence or absence of abnormal vaginal colonization in three groups.

<table>
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<tr>
<th>CL at vaginal culture</th>
<th>&lt; 0.5 cm</th>
<th>0.5cm to 1.5cm</th>
<th>≥ 1.5 cm</th>
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<tbody>
<tr>
<td>Rate of bacterial colonization</td>
<td>17.7 %</td>
<td>17.9 %</td>
<td>13.7 %</td>
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<td>Rate of SPTD according to the presence or absence of abnormal vaginal colonization</td>
<td>93.3 % vs 68.3% (p=0.06)</td>
<td>40.9 % vs. 55.7% (p=0.21)</td>
<td>42.4 % vs.33.2% (p=0.30)</td>
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<td>Rate of SPTD according to the presence or absence of gram negative bacteria</td>
<td>100 % vs 68.6 % (p=0.03)</td>
<td>46.2 % vs 54.0 % (p=0.40)</td>
<td>9.0 % vs 48.0 % (p=0.07)</td>
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- However, in group with CL < 0.5cm, the presence of gram negative bacteria (but not gram positive) was significantly associated with higher SPTD (100% vs. 68.6%, p=0.03). In other two groups, there was no difference in the rate of SPTD according to either the presence of gram positive or negative bacteria.

**Conclusion**

Our data implicate that maternal vaginal colonization by gram-negative bacteria in advanced cervical shortening in PTL or short CL is associated with preterm delivery before 34 weeks.