

Improved criteria to identify risk for spontaneous preterm birth due to a short cervix

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Abstract

Objective Does the combined analysis of compounds in vaginal secretions plus vaginal microbiota composition improve the ability to predict risk for spontaneous preterm birth (SPTB) in women with a short cervix. **Design** Prospective observational study **Setting** Three hospitals in Brazil **Samples** Vaginal secretions from 568 women at 21-24 weeks gestation with cervical length measurement. **Method** Vaginal microbiome composition was determined by analysis of the V1-V3 region of the bacterial 16S ribosomal RNA gene. D- lactic acid and tissue inhibitor of matrix metalloproteinase (TIMP)-1 in vaginal secretions were measured by ELISA. **Main outcome measures** SPTB in relation to cervical length and dominant vaginal bacteria. **Results** When *Lactobacillus crispatus* was the dominant bacterium the concentration of TIMP-1 was lower, and D-lactic acid was higher, than when either *L. iners* or *Gardnerella vaginalis* predominated ($p < 0.001$). By ROC analysis, a D-lactic acid level < 0.7 mM, and a TIMP-1 level > 1.5 ng/ml best predicted the absence of *L. crispatus* dominance. Vaginal levels of TIMP-1 were highest ($p = 0.024$) and D-lactic acid levels were lowest ($p=0.032$) in women with the shortest cervical length. The absence of *L. crispatus* dominance increased the sensitivity for predicting a SPTB from 22.4% to 81.8% or 78.3% in women with a cervical length < 25 mm or < 30 mm, respectively. **Conclusions** Low vaginal D-lactic acid and high TIMP-1 indicates the loss of *L. crispatus* dominance and increased risk for SPTB in women with a short cervix.

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