Abstract:

BACKGROUND: Ascending infection from the colonized vagina to the normally sterile intrauterine cavity is a well-documented cause of preterm birth. The primary physical barrier to microbial ascension is the cervical canal, which is filled with a dense and protective mucus plug. Despite its central role in separating the vaginal from the intrauterine tract, the barrier properties of cervical mucus have not been studied in preterm birth.

METHODS AND FINDINGS: To study the protective function of the cervical mucus in preterm birth we performed a pilot case-control study to measure the viscoelasticity and permeability properties of mucus obtained from pregnant women at high-risk and low-risk for preterm birth. Using extensional and shear rheology we found that cervical mucus from women at high-risk for preterm birth was more extensible and forms significantly weaker gels compared to cervical mucus from women at low-risk for preterm birth. Moreover, permeability measurements using fluorescent microbeads show that high-risk mucus was more permeable compared with low-risk mucus.

CONCLUSIONS: Our findings
suggest that critical biophysical barrier properties of cervical mucus in women at high-risk for preterm birth are compromised compared to women with healthy pregnancy. We hypothesize that impaired barrier properties of cervical mucus could contribute to increased rates of intrauterine infection seen in women with preterm birth. We furthermore suggest that a robust association of spinnbarkeit and preterm birth could be an effectively exploited biomarker for preterm birth prediction.

Stichworte: Cervical Mucus; Permeability; Preterm Birth; Spinnbarkeit

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