Characterization of Elafin in Human Fetal Membranes

Master thesis in Medicine

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Abstract

Background: Preterm birth is a worldwide problem and a leading cause of infant morbidity and mortality. One major risk factor is preterm prelabor rupture of membrane (PPROM), characterized by inflammation and tissue breakdown. Elafin, a secreted protein found in the female reproductive tract that exerts anti-leukoproteinase, anti-inflammatory and anti-microbial activities, could maybe be involved in preventing PPROM.

Objective: Documentation of elafin expression in human fetal membranes at term and PPROM, but also in vitro, after stimulation with lipopolysaccharides (LPS), cigarette smoke extract (CSE) or bacteria commonly cultured in PPROM.

Method: By using RT-PCR, we documented elafin mRNA expression in fetal membrane from women that delivered at term or after PPROM and in fetal membranes (cesarean sections at term, not in labor) in an organ explant system that was stimulated with LPS, CSE, N-Acetylcysteine (NAC). Protein levels were measured, through ELISA, in explants stimulated with mono-/polymicrobial suspensions with heat-killed Mycoplasma hominis, Ureaplasma urealyticum and Gardnerella vaginalis.

Results: Compared to term birth, elafin mRNA expression in fetal membranes from patients with PPROM was significantly increased, p<0.002). In vitro, the mRNA expression was not altered after LPS, CSE or CSE in combination with NAC treatments. Elafin protein levels were increased in fetal membranes stimulated with MH+UU10³ CFU/ml + GV10⁶ CFU/ml compared to controls (p=0.035) and all other bacterial combinations.

Conclusion: PPROM is associated with an increase in elafin mRNA expression in the fetal membrane and at times of bacterial infection, type-, load- and combination of bacteria are relevant for elafin production. Considering our small sample size but biologically plausible results it would be interesting to repeat this study with more samples.