

ABSTRACT

OBJECTIVE:

Cationic proteins found in cervicovaginal secretions (CVS) are known to contribute to the early antiviral immune response against HIV-infection *in vitro*. We here aimed to define additional antiviral factors that are over-expressed in CVS from female sex workers at high risk of infection.

METHODS:

CVS were collected from Kenyan HIV-seronegative ($n = 34$) and HIV-seropositive ($n = 12$) female sex workers, and were compared with those from HIV-seronegative low-risk women ($n = 12$). The highly exposed seronegative (HESN) sex workers were further divided into those with less ($n = 22$) or more ($n = 12$) than three years of documented sex work. Cationic protein-depleted CVS were assessed for HIV-neutralizing activity by a PBMC-based HIV-neutralizing assay, and then characterized by proteomics.

RESULTS:

HIV neutralizing activity was detected in all unprocessed CVS, however only CVS from the female sex worker groups maintained its HIV neutralizing activity after cationic protein-depletion. Differentially abundant proteins were identified in the cationic protein-depleted secretions including 26, 42, and 11 in the HESN >3 yr, HESN <3 yr, and HIV-positive groups, respectively. Gene ontology placed these proteins into functional categories including proteolysis, oxidation-reduction, and epidermal development. The proteins identified in this study include proteins previously associated with the HESN phenotype in other cohorts as well as novel proteins not yet associated with anti-HIV activities.

CONCLUSION:

While cationic proteins appear to contribute to the majority of the intrinsic HIV neutralizing activity in the CVS of low-risk women, a broader range of non-cationic proteins were associated with HIV neutralizing activity in HESN and HIV-positive female sex workers. These results indicate that novel protein factors found in CVS of women with high-risk sexual practices may have inherent antiviral activity, or are involved in other aspects of anti-HIV host defense, and warrant further exploration into their mode of action.