

HIV-1-specific mucosal CD8+ lymphocyte responses in the cervix of HIV-1-resistant prostitutes in Nairobi.

R Kaul, F A Plummer, J Kimani, T Dong, P Kiama, T Rostron, E Njagi, K S MacDonald, J J Bwayo, A J McMichael, S L Rowland-Jones

ABSTRACT Understanding how individuals with a high degree of HIV exposure avoid persistent infection is paramount to HIV vaccine design. Evidence suggests that mucosal immunity, particularly virus-specific CTL, could be critically important in protection against sexually acquired HIV infection. Therefore, we have looked for the presence of HIV-specific CD8+ T cells in cervical mononuclear cells from a subgroup of highly HIV-exposed but persistently seronegative female sex workers in Nairobi. An enzyme-linked immunospot assay was used to measure IFN-gamma release in response to known class I HLA-restricted CTL epitope peptides using effector cells from the blood and cervix of HIV-1-resistant and -infected sex workers and from lower-risk uninfected controls. Eleven of 16 resistant sex workers had HIV-specific CD8+ T cells in the cervix, and a similar number had detectable responses in blood. Where both blood and cervical responses were detected in the same individual, the specificity of the responses was similar. Neither cervical nor blood responses were detected in lower-risk control donors. HIV-specific CD8+ T cell frequencies in the cervix of HIV-resistant sex workers were slightly higher than in blood, while in HIV-infected donor cervical response frequencies were markedly lower than blood, so that there was relative enrichment of cervical responses in HIV-resistant compared with HIV-infected donors. HIV-specific CD8+ T cell responses in the absence of detectable HIV infection in the genital mucosa of HIV-1-resistant sex workers may be playing an important part in protective immunity against heterosexual HIV-1 transmission.