

Abstract

A biological explanation for the reduction in HIV-1 (HIV) acquisition after male circumcision may be that removal of the foreskin reduces the number of target cells for HIV. The expression of potential HIV target cells and C-type lectin receptors in foreskin tissue of men at risk of HIV infection were thus analyzed. Thirty-three foreskin tissue samples, stratified by Herpes simplex virus type 2 status, were obtained from a randomized, controlled trial conducted in Kenya. The samples were analyzed by confocal in situ imaging microscopy and mRNA quantification by quantitative RT-qPCR. The presence and location of T cells (CD3(+)CD4(+)), Langerhans cells (CD1a(+)Langerin/CD207(+)), macrophages (CD68(+) or CD14(+)), and submucosal dendritic cells (CD123(+)BDCA-2(+) or CD11c(+)DC-SIGN(+)) were defined. C-type lectin receptor expressing cells were detected in both the epithelium and submucosa, and distinct lymphoid aggregates densely populated with CD3(+)CD4(+) T cells were identified in the submucosa. Although the presence of lymphoid aggregates and mRNA expression of selected markers varied between study subjects, Herpes simplex virus type 2 serostatus was not the major determinant for the detected differences. The detection of abundant and superficially present potential HIV target cells and submucosal lymphoid aggregates in foreskin mucosa from a highly relevant HIV risk group demonstrate a possible anatomical explanation that may contribute to the protective effect of male circumcision on HIV transmission.