

Abstract

Human urine has been poorly investigated with regard to infection with human immunodeficiency virus (HIV). Here, we have studied the anti-infective functional properties of human urine against HIV. The effect of fresh urine pools on CCR5- and CXCR4-tropic HIV-1 was evaluated by using four in vitro mucosal models: reduction of infectivity of urine-treated HIV-1 particles, HIV-1 attachment to immature monocyte-derived dendritic cells (iMDDC), transfer of HIV-1 particles from iMDDC to autologous CD4 T cells, and HIV-1 transcytosis through epithelial cells. Human urine partially disrupted both CCR5- and CXCR4-tropic HIV-1 particles, moderately decreased the adsorption of HIV-1 on dendritic cells, and partially decreased the transfer of HIV-1 particles from dendritic cells to autologous T cells. These findings demonstrate partial inactivation of HIV infectivity and suggest that voiding urine after coitus could play a potential role in reducing the risk of HIV infection by both mechanically flushing out and neutralizing the infectivity of HIV-1 particles present in the genital tract.