

Breast milk alpha-defensins are associated with HIV type 1 RNA and CC chemokines in breast milk but not vertical HIV type 1 transmission

Abstract:

Alpha-defensins are proteins exhibiting *in vitro* anti-HIV-1 activity that may protect against mother-to-child transmission of HIV-1 via breast milk. Correlates of alpha-defensins in breast milk and transmission risk were determined in a cohort of HIV-1-infected pregnant women in Nairobi followed for 12 months postpartum with their infants. Maternal blood was collected antenatally and at delivery for HIV-1 viral load and infant HIV-1 infection status was determined < 48 h after birth and at months 1, 3, 6, 9, and 12. Breast milk specimens collected at month 1 were assayed for alpha-defensins, HIV-1 RNA, subclinical mastitis, and CC and CXC chemokines. We detected alpha-defensins in breast milk specimens from 108 (42%) of 260 HIV-1-infected women. Women with detectable alpha-defensins (> or =50 pg/ml) had a median concentration of 320 pg/ml and significantly higher mean breast milk HIV-1 RNA levels than women with undetectable alpha-defensins (2.9 log(10) copies/ml versus 2.5 log(10) copies/ml, $p = 0.003$). Increased alpha-defensins concentrations in breast milk were also associated with subclinical mastitis (Na (+)/K(+) ratio > 1) and increased breast milk chemokine levels. Overall, 40 (15%) infants were HIV-1 uninfected at birth and subsequently acquired HIV-1. There was no significant association between month 1 alpha-defensins and risk of HIV-1 transmission. In conclusion, alpha-defensins were associated with breast milk HIV-1 viral load, chemokine levels, and subclinical mastitis, all of which may alter risk of infant HIV-1 acquisition. Despite these associations there was no significant relationship between breast milk alpha-defensins and mother-to-child transmission, suggesting a complex interplay between breast milk HIV-1, inflammation, and antiinfective factors