Maternal HLA homozygosity and mother-child HLA concordance increase the risk of vertical transmission of HIV-1.

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Abstract

BACKGROUND:

Mother-child human leukocyte antigen (HLA) concordance and maternal HLA homozygosity may increase the risk of vertical transmission of human immunodeficiency virus type 1 (HIV-1) risk by reducing infant immune responses.

METHODS:

We analyzed mother-child HLA concordance and maternal HLA homozygosity in a Kenyan perinatal cohort receiving antenatal zidovudine. HLA concordance was scored as the number of shared class I alleles, and relative risk estimates were adjusted for maternal HIV-1 load.

RESULTS:

Among 277 mother-infant pairs, HIV-1 transmission occurred in 58 infants (21%), with in utero transmission in 21 (36%), peripartum transmission in 26 (45%), and transmission via breast-feeding in 11 (19%). With increased concordance, we observed a significant increase in the risk of transmission overall (adjusted hazard ratio [aHR], 1.3 [95% confidence interval {CI}, 1.0-1.7]; P = .04 in utero (adjusted odds ratio, 1.72 [95% CI, 1.0-1.7]; P = .04), and via breast-feeding (aHR, 1.6 [95% CI, 1.0-2.5]; P = .04). Women with homozygosity had higher plasma HIV-1 RNA levels at 32 weeks of gestation (5.1 vs. 4.8 log(10) copies/mL; P = .03) and an increased risk of transmission overall (aHR, 1.7 [95% CI, 1.1-2.7]; P = .03) and via breast-feeding (aHR, 5.8 [95% CI, 1.9-17.7]; P = .002).

CONCLUSION:

The risks of overall, in utero, and breast milk HIV-1 transmission increased with HLA concordance and homozygosity. The increased risk may be due to reduced alloimmunity or less diverse protective immune responses.