



CORRECTED PROOF

Quasispecies Diversity Is a Major Risk Factor for Vertical Hepatitis C Virus Transmission

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Abstract

Background

Vertical transmission is the major cause of pediatric hepatitis C virus (HCV) infection. The objective of this study was to better understand HCV pathogenesis in pregnant women and provide insights into risk factors and mechanisms involved in vertical transmission.

Methods

Evolutionary dynamics of HCV variant spectra and HCV-specific neutralizing antibody responses were examined using high-throughput sequencing and pseudoparticle-based assays in pregnant women monoinfected with HCV (n = 17) or coinfecting with HCV and human immunodeficiency virus (HIV)-1 (n = 15).

Results

Overall, statistically significant associations were found between HCV quasispecies diversity, selective pressure exerted on the HCV E2 envelope protein, and neutralizing activity of maternal immunoglobulins. Women with low quasispecies diversity displayed significantly higher mean aspartate aminotransferase and alanine aminotransferase levels throughout pregnancy, but this difference was restricted to monoinfected participants. Low quasispecies diversity and inefficient neutralizing activity were also significantly associated with vertical transmission, but only in the monoinfected group.

Conclusions

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These results indicate that maternal neutralizing antibody responses play a role in the prevention of vertical HCV transmission, but not in presence of HIV-1 coinfection, and suggest that the mechanism of vertical transmission may be different between monoinfected and coinfecting women. These findings could inform management strategies for the prevention of vertical HCV transmission.

Keywords: [coinfection](#), [hepatitis C virus \(HCV\)](#), [human immunodeficiency virus type 1 \(HIV-1\)](#), [pregnancy](#), [vertical transmission](#)

Topic: [pregnancy](#), [vertical disease transmission](#), [hiv-1](#), [mothers](#), [hepatitis c virus](#), [coinfection](#), [neutralizing antibodies](#), [quasispecies](#)

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