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Interaction between NK cells and HLA-G1 at the placental interface of HIV-1 infected pregnant women: Additional risk factors or physiological association

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Abstract

Background: Human Leucocyte Antigen-G (HLA-G) molecules are involved in the inhibition of cell-mediated immune responses and could promote the propagation of HIV-1 infection across the placental interface thus increasing the risk of vertical transmission. Therefore, the objective of this study was to assess whether the Major Histocompatibility Complex (MHC) - coded molecule HLA-G inhibits Natural Killer (NK) cell activity thereby, assisting viral penetration across the placental barrier in HIV-1 positive pregnant women.

Study Design and Methods: Natural Killer (CD56+) cell activity and placental HLA-G1 expression was assessed using immunohistochemistry and real-time polymerase chain reaction (RT-PCR) techniques, respectively. Studies were performed on a total of fifty five placental samples obtained from HIV-1 infected mothers at birth.

Results: Low numbers of NK cells increased risk of vertical transmission [OR = 3.424 (95% CI 0.65-17.89)]. The risk of babies becoming infected increased by 1.3 with every 1 unit increase in HLA-G1 expression. A positive correlation was observed between mothers' log viral load and transmission of infection to the baby (p = 0.047; 95%CI 1.029-11.499).

Conclusion: Low NK cell activity at the placental interface increased the risk of vertical transmission. Maternal viral load remained a strong predictor of viral transmission.