Mucosal Neisseria gonorrhoeae coinfection during HIV acquisition is associated with enhanced systemic HIV-specific CD8 T-cell responses.

Abstract

BACKGROUND:
The host immune response against mucosally acquired pathogens may be influenced by the mucosal immune milieu during acquisition. As Neisseria gonorrhoeae can impair dendritic cell and T-cell immune function, we hypothesized that coinfection during HIV acquisition would impair subsequent systemic T-cell responses.

METHODS:
Monthly screening for sexually transmitted infections was performed in high risk, HIV seronegative Kenyan female sex workers as part of an HIV prevention trial. Early HIV-specific CD8 T-cell responses and subsequent HIV viral load set point were assayed in participants acquiring HIV, and were correlated with the presence of prior genital infections during HIV acquisition.

RESULTS:
Thirty-five participants acquired HIV during follow-up, and 16 out of 35 (46%) had a classical sexually transmitted infection at the time of acquisition. N. gonorrhoeae coinfection was present during HIV acquisition in 6 out of 35 (17%), and was associated with an increased breadth and magnitude of systemic HIV-specific CD8 T-cell responses, using both interferon-gamma gamma and MIP-1 beta as an output. No other genital infections were associated with differences in HIV-specific CD8 T-cell response, and neither N. gonorrhoeae nor other genital infections were associated with differences in HIV plasma viral load at set point.

CONCLUSION:
Unexpectedly, genital N. gonorrhoeae infection during heterosexual HIV acquisition was associated with substantially enhanced HIV-specific CD8 T-cell responses, although not with differences in HIV viral load set point. This may have implications for the development of mucosal HIV vaccines and adjuvants.