HIV-Infected Individuals Exhibit Suppressed Respiratory Mucosal Inflammation
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METHODS

RESULTS

COMPARISON TO COHORT INCLUDING HIV-INFECTED SUBJECTS WITH RECENT CONTROL OF VIREMIA

BACKGROUND

Objectives: To identify differences in the upper respiratory mucosal immune response between HIV-infected and HIV-uninfected individuals

Methods:

- Pulmonary infectious complications are a frequent cause of morbidity and mortality in HIV-infected patients
- While bacterial and fungal infections are commonly described pathogens, emerging evidence suggests that respiratory viruses play an increasingly important role in the lung health of HIV infected individuals
- Of 70 HIV-infected patients admitted to UNC with a respiratory complaint, 30 (43%) had an infected pathogen identified from the respiratory tract – 23 (77%) of these had at least one respiratory virus detected (Figure 1)
- Prior studies demonstrate that increased incidence of upper respiratory infections in HIV-infected compared to uninfected persist even in the setting of increasing CD4 counts
- While HIV is associated with altered mucosal inflammation in the GI tract and vagina, how HIV affects the respiratory tract is not known

Figure 1. Etiology of respiratory infection identified in all HIV-infected patients admitted (n=70)

Objective: To identify differences in the upper respiratory mucosal immune response between HIV-infected and HIV-uninfected individuals

Methods:

- 10 HIV-infected and 10 HIV-uninfected individuals enrolled
  - 5 men and 5 women in each group, non-smokers, ages 18-49
  - No underlying cardiopulmonary disease
  - No active respiratory symptoms
  - HIV-infected pts were on antiretroviral therapy (ART) with durable viral load suppression (≥ 2 undetectable viral loads in the 6 months prior to study participation)
  - Nasal respiratory samples and serum collected at same time point
  - Epithelial lining fluid (ELF)
  - Nasal lavage fluid (NLF)
  - Serum and ELF analyzed using ELISAs targeted at pro-inflammatory cytokines
  - NLF cell pellet analyzed by flow cytometry for nasal-specific immune cells

IL-16, a T-cell chemoattractant and inhibitor of HIV replication is decreased in HIV-infected individuals compared with HIV-uninfected individuals (p=0.09):

IL-16

This study was supported by awards from the UNC Center for AIDS Research Developmental Core and the National Heart, Lung, and Blood Institute (T32 HL710640)

Questions/comments: Please contact Subhashini.sellers@unchealth.unc.edu
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RESULTS

Decreased T-cells, including both CD4+ and CD8+ populations in the NLF of HIV-infected individuals compared to HIV-uninfected subjects:

![Graph showing decreased T-cells](image)

Decreased levels of IL-16, a T-cell chemoattractant and inhibitor of HIV replication in HIV-infected compared to uninfected subjects (p=0.09):

![Graph showing decreased IL-16](image)

CONCLUSIONS

• In contrast to the increased HIV-associated inflammation seen at other mucosal surfaces, the upper respiratory tract demonstrates suppressed mucosal immunity
• Compartmentalized immune suppression at the level of the respiratory tract could explain the increased susceptibility to and severity of disease during respiratory viral infections in HIV-infected individuals
• Different profiles of relative immune suppression in subjects with durable suppression of HIV viremia and those with more recent control suggest that viral load control with ART may play a role in partial reversal of the suppressed mucosal immune response
• Analysis of more subjects with active viremia and recent viral load suppression is ongoing to further explore potential mechanisms

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