

Characterization of bacterial infections in people living with HIV from January 2018 to January 2023

C. Nonne¹, D. E. Compagnino¹, D. Tomolillo³, G. Sfara¹, R. Campagna¹, M. G. Leone¹, G. Antonelli^{1,2}, G. Raponi^{2,3}, O. Turriziani¹

¹Department of Molecular Medicine, Sapienza University of Rome, Italy

²Laboratory for Clinical Microbiology, Sapienza University Hospital "Policlinico Umberto I", Italy

³Department of Public Health and Infectious Diseases, Sapienza University of Rome, Italy

Introduction

- According to UNAIDS, since the start of the epidemic around 85.6 million people have acquired HIV. Over the ensuing decades, the rate of people living with HIV (PLHIV) rised dramatically, as did the rate of fatalities. In Italy, a total of 140.000 individuals aged 15 or more of PLHIV were estimated at the end of 2022. Despite the high incidence of HIV, the effectiveness of antiretroviral therapy (ART) in the past decade has significantly reduced HIV-related morbidity and mortality. However, hospitalization still remains a significant concern among PLHIV. Furthermore, assessing immunological status is crucial in evaluating infections, as the severity of microbiological infections can be influenced by the patient's immune state. In PLHIV monitoring the CD4 count is key to identify progressive immunological decline that can lead to AIDS. Our study aims to assess CD4 cell count decline in PLHIV with BSI, RI, UTI and tuberculosis infection (TB).

Methods

- We conducted a retrospective evaluation of bacterial infections in 2067 PLHIV who were either newly diagnosed with HIV infection, regularly followed up, or hospitalized at the Policlinico Umberto I in Rome, from January 2018 to January 2023. Bacteria were isolated on standard culture media (BD BBL™, Italy), identification was performed using the Matrix-Assisted Laser Desorption Ionization-Time of Flight (MALDI-TOF) Biotyper (Bruker Daltonics Inc., Germany). In PLHIV with BSI, RI, UTI and TB, absolute CD4 count (cells/mcL) were performed by cytofluorometric analysis of whole blood samples (BD Biosciences, FACSLyric) within 100 days before or after the acute microbiological event.

Results (1)

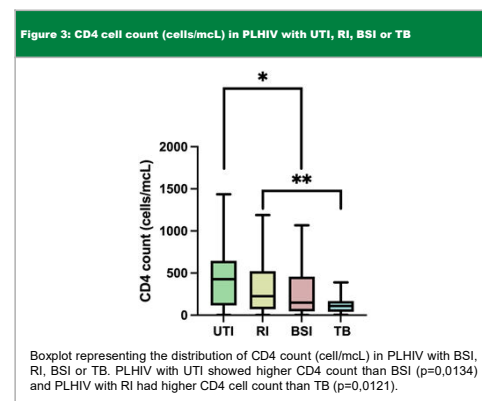
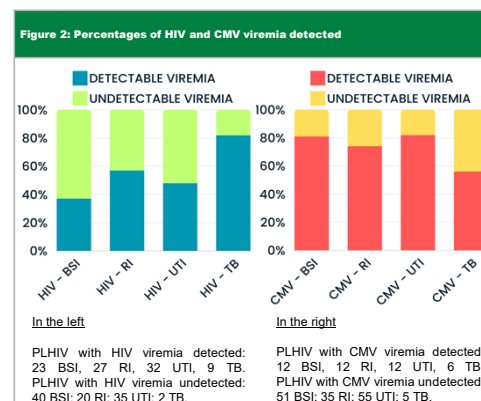
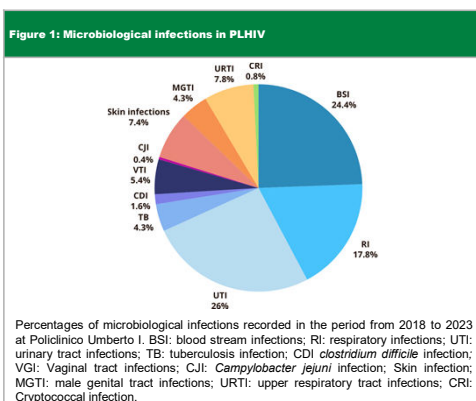
- Out of a total of 2067 PLHIV, the following infections were documented: 63 (3%) bloodstream infections (BSI), 46 (2,2%) respiratory infections (RI), and 67 (3,2%) urinary tract infections (UTI). Among these, 33% with BSI, 57% with RI, and 48% with UTI also had HIV viremia detected at the time of infection. Additionally, 53 swabs from various body sites resulted positive for 14 vaginal tract infections, 20 upper respiratory tract infections, and 19 skin infections. Worthy of mention were 2 Cryptococcal infections, 1 Campylobacter Jejuni infection, 4 Clostridium difficile infections, and 11 male genital tract infections. Furthermore, 11 individuals tested positive for tuberculosis infection.

Results (2)

- CMV reactivation was also detected in individuals with BSI (19%), RI (26%), UTI (18%). Furthermore, it was found that individuals with BSI, RI, and UTI had detectable viremia for Hepatitis C virus (HCV) and Hepatitis B virus (HBV) at the following percentages: 27% for HCV and 30% for HBV (BSI), 19% for HCV and 21% for HBV (RI), and 12% for HCV and 18% for HBV (UTI). Among them, 9 had detectable HIV viremia and 6 Citomegalovirus (CMV) reactivation at the time of tuberculosis infection.

Results (3)

- Median value of CD4 cell count in PLHIV with UTI, RI, BSI and TB was: 428 cells/mcL, 226 cells/mcL, 149 cells/mcL, 109 cells/mcL, respectively. PLHIV with UTI showed higher CD4 count than BSI (p=0,0134) and PLHIV with RI had higher CD4 cell count than TB (p=0,0121). As expected, PLHIV with TB had the lowest median CD4 count.



Conclusion

- Despite the success of antiretroviral therapy, hospitalization and severe infections remain a concern among PLHIV. This type of analysis can help understand the burden of bacterial infections in this population, identify any trends or changes over time, and define strategies for prevention, diagnosis, and management. Furthermore, the CD4 cell count is a critical parameter in HIV management, serving as a reliable indicator of a patient's immune status and guiding clinical treatment decisions. In addition to examining the specific microbiological features of the infection, it is crucial to assess the immunological status.