Virologic failure following low-level viremia and viral blips during antiretroviral therapy: results from a European multicenter cohort

Olof Elvstam[1,2], Kasper Malmborn[1], Sixten Elén[1], Gaetano Marrone[3], Federico Garcia[4], Maurizio Zazzi[5], Anders Sönnerborg[6,7], Michael Böhm[8], Carole Seguin-Devaux[9], Per Björkman[1,10]
Affiliations expand
PMID: 36100984 DOI: 10.1093/cid/ciac762

Abstract

Background: It is unclear whether low-level viremia (LLV), defined as repeatedly detectable viral load (VL) of <200 copies/mL, and/or transient viremic episodes (blips) during antiretroviral therapy (ART), predict future virologic failure. We investigated the association between LLV, blips, and virologic failure (VF) in a multi-center European cohort.

Methods: People with HIV-1 who started ART 2005 or later were identified from the EuResist Integrated Database. We analyzed the incidence of VF (≥200 copies/mL) depending on viremia exposure, starting 12 months after ART initiation (grouped as suppression [≤50 copies/mL], blips [isolated VL of 51-999 copies/mL], and LLV [repeated VLs of 51-199 copies/mL]) using Cox proportional hazard models adjusted for age, sex, injecting drug use, pre-ART VL, CD4 count, HIV-1 subtype, type of ART, and treatment experience. We queried the database for drug resistance mutations (DRM) related to episodes of LLV and VF and compared those with baseline resistance data.

Results: During 81,837 person-years of follow-up, we observed 1,424 events of VF in 22,523 participants. Both blips (adjusted subhazard ratio [aHR], 1.7; 95% confidence interval [CI], 1.3-2.2) and LLV (aHR, 2.2; 95% CI, 1.6-3.0) were associated with VF, compared with virologic suppression. These associations remained statistically significant in sub-analyses restricted to people with VL <200 copies/mL and those starting ART 2014 or later. Among people with LLV and genotype data available within 90 days following LLV, 49/140 (35%) had at least one DRM.

Conclusions: Both blips and LLV during ART are associated with increased risk of subsequent VF.