

Real World Evidence: insights from Italian Cohorts

OC 35 Virological and Clinical Outcomes of PWH with and without Advanced HIV Disease and very high HIV-RNA at ART initiation: Data from the ICONA Foundation Cohort

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ABSTRACT

Background: Uncertainties persist regarding virological and clinical outcomes of people with HIV (PWH) across different HIV-RNA levels, particularly among those presenting with very high viral loads. We aimed to assess time to virological suppression (VS) and clinical outcomes among PWH initiating their first ART according to baseline HIV-RNA strata and advanced HIV disease (AHD) status.

Methods: We included all ART-naïve PWH enrolled in the ICONA cohort between 2018 and 2024 who initiated an integrase inhibitor-based regimen. Individuals with acute/recent HIV infection (negative test <12 months before enrolment) were excluded. Baseline HIV-RNA was stratified as <100,000, 100,000–499,999, and ≥500,000 copies/mL. AHD was defined as CD4 <200 cells/mm³ and/or AIDS. Baseline characteristics were summarized according to AHD status. Kaplan–Meier curves were used to estimate time to (1) first VS (HIV-RNA <50 copies/mL) and (2) a composite clinical endpoint (new AIDS events, major cardiovascular events, cancer, or death), according to HIV-RNA strata and AHD status. Cox regression models assessed the effect of AHD within each HIV-RNA stratum on virological and clinical outcomes, adjusting for sex assigned at birth, age, laboratory assay, mode of HIV acquisition, and country of origin.

Results: A total of 3,798 PWH were included, of whom 1,582 had AHD (539 [34.1%] with AIDS defining

conditions). Compared with those without AHD, individuals with AHD were older (45 [IQR 36–55] vs 38 [30–49] years, $p < 0.001$) and more frequently presented with HIV-RNA $\geq 500,000$ copies/mL (41.2% vs 13.6%, $p < 0.001$). Median CD4 count was 64 cells/mm³ (IQR 28–136) in PWH with AHD versus 424 cells/mm³ (IQR 313–581) in those without AHD ($p < 0.001$) (Table 1).

Overall, PWH with AHD achieved VS more slowly than those without AHD. The longest time to VS was observed among PWH with HIV-RNA $\geq 500,000$ copies/mL, particularly in those with AHD, who achieved VS after a median of 7.1 months (95% CI 6.6–7.8), compared with 5.8 months (95% CI 5.1–6.6) in those without AHD. The corresponding probabilities of VS at 12 and 24 months were 70.1% vs 77.2% and 87.4% vs 90.4%, respectively (Figure 1A,B,C and 2).

After adjustment, PWH with AHD had a consistently lower likelihood of achieving VS across all HIV-RNA strata (<100,000 copies/mL: aHR 0.85 [95% CI 0.75–0.96]; 100,000–499,999: aHR 0.85 [95% CI 0.75–0.96]; $\geq 500,000$: aHR 0.84 [95% CI 0.72–0.98]). After adjustment, PWH with AHD showed a progressively higher risk of the composite clinical endpoint with increasing HIV-RNA levels: <100,000 copies/mL aHR 4.70 (95% CI 3.07–7.21); 100,000–499,999 aHR 5.23 (95% CI 2.82–9.69); and $\geq 500,000$ aHR 6.15 (95% CI 2.99–12.63).

Conclusion: PWH with AHD had a consistently lower probability of achieving virological suppression, regardless of baseline HIV-RNA levels. Moreover, the risk of adverse clinical outcomes among individuals with AHD increased progressively with higher HIV-RNA levels at ART initiation.

Table 1. Characteristics of the study population

	Overall	AHD	Without AHD	p
Year, n (%)	3798	1582	2216	0.003
2018	555 (14.6)	247 (15.6)	308 (13.9)	
2019	619 (16.3)	241 (15.2)	378 (17.1)	
2020	422 (11.1)	158 (10.0)	264 (11.9)	
2021	493 (13.0)	214 (13.5)	279 (12.6)	
2022	513 (13.5)	185 (11.7)	328 (14.8)	
2023	664 (17.5)	293 (18.5)	371 (16.7)	
2024	532 (14.0)	244 (15.4)	288 (13.0)	
HIV-RNA group, n (%)				<0.001
<100K	1712 (45.1)	367 (23.2)	1345 (60.7)	
100–499K	1133 (29.8)	563 (35.6)	570 (25.7)	
$\geq 500K$	953 (25.1)	652 (41.2)	301 (13.6)	
Age (median [IQR])	42 [32, 52]	45 [36, 55]	38 [30, 49]	<0.001
Males (%)	3089 (81.3)	1259 (79.6)	1830 (82.6)	0.022
Italian (%)	2646 (69.7)	1070 (67.6)	1576 (71.1)	0.023
Mode of HIV acquisition, n (%)				<0.001
Other	467 (12.3)	210 (13.3)	257 (11.6)	
Heterosexual	1679 (44.2)	817 (51.6)	862 (38.9)	
MSM	1652 (43.5)	555 (35.1)	1097 (49.5)	
Education, n (%)				<0.001
Non university	1437 (37.8)	603 (38.1)	834 (37.6)	
University	418 (11.0)	134 (8.5)	284 (12.8)	
Unknown	1943 (51.2)	845 (53.4)	1098 (49.5)	
Employment, n (%)				0.628
Employed	2537 (66.8)	1043 (65.9)	1494 (67.4)	
Unemployed	446 (11.7)	190 (12.0)	256 (11.6)	
Unknown	815 (21.5)	349 (22.1)	466 (21.0)	
CD4 (median [IQR])	272 [90, 469]	64 [28, 136]	424 [313, 581]	<0.001
Laboratory assay, n (%)				0.004
Not-Hologic	2373 (62.5)	1032 (65.2)	1341 (60.5)	
Hologic	917 (24.1)	368 (23.3)	549 (24.8)	
other-missing	508 (13.4)	182 (11.5)	326 (14.7)	

Figure 1 A, B, C. KM of time to virological suppression according to HIV-RNA strata and AHD

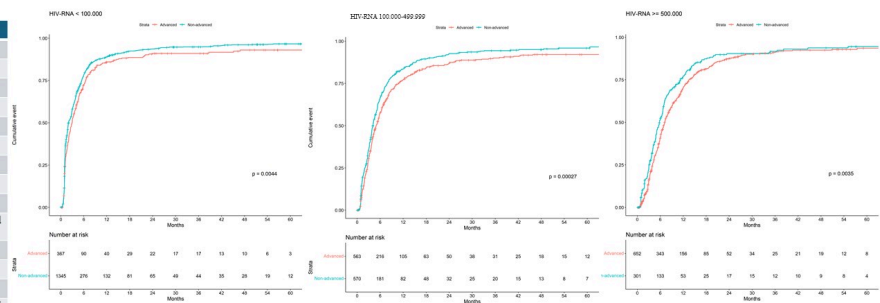


Figure 2 Virological suppression rate at 12 and 24 months virological suppression according to HIV-RNA strata and AHD

