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OC 28 **Rates of viral rebound (VR) >200 copies/mL after a viral load (VL) ≤50 copies/mL according to period and duration of viral suppression on first-line cART**

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Abstract:

Background: We investigated rates of viral rebound (VR) after suppression on first-line cART focusing on calendar year as a proxy for changes in therapeutical and clinical approaches, adherence and resistance over time.

Methods: All patients in Icona starting first cART on or after 1998 who achieved viral load (VL) suppression ≤50 cp/mL were included in a time to VR analysis stratified by calendar period of suppression (1998-2000; 2001-2003; 2004-2006; 2007-2009, 2010-2015). Follow-up accrued from the date of viral suppression up to VR (defined at the time of the first of two consecutive VL >200 cp/mL) or last available VL. Sensitivity analyses using 50 cp/mL and 500 cp/mL to define VR were also performed. Poisson regression relative rates (RR) were estimated both unadjusted and after controlling for potential confounders: sex, age, mode of HIV transmission, baseline VL, CD4 nadir, AIDS diagnosis prior to cART, hepatitis co-infections, therapy started (PI/r vs. NNRTI vs. other).

Results: We included 6,709 patients achieving a VL< 50 cp/ml with first line cART. Of these, 814 (12%) did so in 1998-2000; 1110 (16%) in 2001-2003; 945 (14%) in 2004-2006; 770 (11%) in 2007-2009, 3070 (46%) in 2010-2015. Figure1A shows patients' characteristics according to calendar year of suppression. Overall, we observed 1,205 VR >200cp/ml over 23048 PYFU; rate (IQR) 5.23 (4.94-5.53)/100 PYFU. The rate of VR >200cp/ml substantially declined with longer duration of VL suppression, from 8 (7.32-8.74)/100PYFU in people with a suppressed VL for 1 year to 0.85 (0.44-1.63)/100PYFU in those with >10 years of VL suppression; RR per additional year of VL suppression ≤50 cp/ml: 0.81, 95% CI:0.78-0.83, p<.0001. Figure 1B shows VR rates according to the duration of VL suppression <50cp/ml stratified by calendar period. Interestingly, the VR rate recorded in people achieving suppression in 2010-2015 after 1 year of viral suppression was considerably lower than that estimated after >5 years of suppression in those achieving it in previous years: 0.9 (0.6-1.4)/100PYFUvs. 3.3 (2.6 -4.2)/100PYFU in 1998-2000 and 2.2 (1.7-2.8) /100PYFU, in 2001-2003. Adjusted RR per additional year of VL suppression <50cp/ml were: 0.76 (95% CI 0.73-0.80), (1998-2000); 0.64 (95%CI 0.61 -0.68), (2001-2003); 0.64 (95%CI 0.59 -0.69), (2004-2006); 0.68 (95%CI , 0.57-0.80), (2007-2009); 1.04 (95%CI 0.78-1.40), (2010 -2015)(p-value for interaction =0.004). Results were similar when using the 50 or 500 copies/mL thresholds to define VR.

Conclusions: We confirm a strong association between longer VL suppression and lower risk of VR. The availability of data of people recently achieving VL suppression allowed us to compare current versus historical VR rates. In our population, VR rates in recent years are immediately remarkably low and lower than those observed even after several years of controlled VL on earlier cART, likely reflecting more efficacious regimens, better adherence, and/or lower resistance.

Figure 1A. Characteristics of patients stratified by period of viral suppression

Characteristics	1998-2000 N= 814	2001-2003 N= 1110	2004-2006 N= 945	2007-2009 N= 770	2010-2015 N= 3070	p-value[*]	Total N= 6709
Gender, n(%)						<.001	
Female	227 (27.9%)	331 (29.8%)	308 (32.6%)	205 (26.6%)	605 (19.7%)		1676 (25.0%)
Mode of HIV Transmission, n(%)						<.001	
IDU	309 (38.0%)	329 (29.6%)	263 (27.8%)	141 (18.3%)	229 (7.5%)		1271 (19.0%)
Homosexual contacts	170 (20.9%)	262 (23.6%)	190 (20.1%)	239 (31.1%)	1338 (43.7%)		2199 (32.8%)
Heterosexual contacts	289 (35.5%)	454 (40.9%)	432 (45.7%)	348 (45.2%)	1284 (41.8%)		2807 (41.8%)
Other/Unknown	46 (5.7%)	65 (5.9%)	60 (6.3%)	41 (5.3%)	211 (6.9%)		423 (6.3%)
Nationality, n(%)						<.001	
Not Italian	35 (4.3%)	68 (6.1%)	87 (9.2%)	85 (11.0%)	555 (18.1%)		830 (12.4%)
AIDS diagnosis, n(%)						<.001	
Yes	126 (15.5%)	207 (18.6%)	127 (13.4%)	110 (14.3%)	301 (9.8%)		871 (13.0%)
Hepatitis co-infection[*], n(%)						<.001	
No	248 (30.5%)	378 (34.1%)	395 (41.8%)	343 (44.5%)	1361 (44.3%)		2725 (40.6%)
Yes	212 (26.0%)	273 (24.6%)	254 (26.9%)	139 (18.1%)	192 (6.3%)		1070 (15.9%)
Not tested	354 (43.5%)	459 (41.4%)	296 (31.3%)	288 (37.4%)	1517 (49.4%)		2914 (43.4%)
Calendar year of starting cART[**]						<.001	
Median (IQR)	1998 (1997, 1998)	2000 (1998, 2001)	2003 (2001, 2004)	2007 (2006, 2008)	2011 (2010, 2012)		2008 (2000, 2011)
Age, years						<.001	
Median (IQR)	36 (32, 41)	36 (32, 42)	36 (31, 41)	37 (32, 44)	38 (31, 45)		37 (32, 43)
CD4 count, cells/mmc						<.001	
Median (IQR)	316 (155, 473)	279 (121, 458)	272 (157, 388)	284 (188, 389)	320 (193, 425)		301 (170, 425)
Viral load at first cART,						<.001	

Figure 1B. Rates of VL rebound >200 cp/ml according to duration of suppression (≤50cp/mL) stratified by calendar year