Inflammatory biomarkers decay after first-line antiretroviral treatment initiation with dolutegravir/lamivudine or bictegravir/emtricitabine/tenofovir alafenamide.

What puts the fire out faster?

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Background

Human immunodeficiency virus (HIV) persists in reservoirs, promoting immune activation and chronic inflammation, which are associated with elevated risks for AIDS-defining and non-AIDS-defining diseases, as well as increased mortality in this population (1-5). Effective antiretroviral therapy (ART) penetration into reservoirs is essential for achieving viral suppression and inflammation control (6).
This study compares the rate of inflammatory biomarker reduction in ART-naïve individuals with HIV initiating dual ART (Dolutegravir/Lamivudine, DTG/3TC) versus triple ART (Bictegravir/Emtricitabine/Tenofovir alafenamide, BIC/FTC/TAF).

Materials and methods

The study was conducted as a sub-study within an open-label multicenter randomized pilot clinical trial (7). Twenty-five participants were randomized 2:1 to receive either DTG/3TC (16 participants) or BIC/FTC/TAF (9 participants). Inflammatory biomarkers, including high-sensitivity C-reactive protein (hs-CRP), interleukin-6 (IL-6), D-dimer, soluble CD163 (sCD163), soluble CD14 (sCD14), vascular cell adhesion molecule-1 (VCAM-1), and fatty acid-binding protein 2 (FABP-2), were measured in blood plasma at baseline and up to 24 weeks.

Results

Most participants achieved viral suppression by week 24. Both treatment groups showed a decline in inflammatory biomarkers from baseline, but no statistically significant differences were observed between the two groups. (Table 1).
Specifically, hs-CRP levels declined by -0.14 mg/L in the DTG/3TC group and -3.92 mg/L in the BIC/FTC/TAF group. D-dimer changes were -30.7 µg/L for DTG/3TC and -72.2 µg/L for BIC/FTC/TAF. sCD163 decreased by -220.1 ng/L in the DTG/3TC group and -233.7 ng/L in the BIC/FTC/TAF group. sCD14 showed reductions of -134.5 µg/L and -242.8 µg/L in the DTG/3TC and BIC/FTC/TAF groups, respectively.

Table 1.Prospective biomarkers values

Biomarker	Treatment group	Baseline	Day 3	Day 7	Day 14	Day 28	Week 12	Week24
CRP (mg/L)	DTG+3TC	1.7 [1; 2.5]	2.3 [1; 3.7]	3.8 [0.5; 7.1]	2.6 [0.7; 4.4]	1.9 [0.8; 3.0]	2 [0.9; 3.0]	1.6 [1.03;2.21]
	BIC/F/TAF	7.8 [0; 17.4]	4.6 [0; 9.7]	2.9 [0.7; 5.]	1.6 [0.7; 2.4]	1.1 [0.4; 1.8]	1.2 [0.2; 2.2]	1.43 [0.15;2.72]
p: value			0.1	0.08	0.11	0.13	0.32	0.37
IL-6 [subjects >3.5 ng/L (%)]	DTG+3TC	1 (6.25%)	2 (12.5%)	3 (18.75%)	2 (14.29%)	3 (18.75%)	0 (0%)	1(6.25%)
	BIC/F/TAF	2 (22.22%)	2 (22.22%)	2 (25%)	2 (22.22%)	1 (11.11%)	0 (0%)	1 (14.2%)
DD (µg/L)	DTG+3TC	79.6 [49.1; 110.2]	119 [74.1; 163.9]	99 [60.5; 137.4]	82.2 [42.8; 121.7]	59.6 [36.9; 82.3]	51.9 [34.9; 68.9]	48.9 [33.9;63.9]
	BIC/F/TAF	186.2 [53.3; 319]	214.6 [54.2; 375]	183 [50.5; 315.4]	142.2 [42.9; 241.5]	141.3 [41.9; 240.7]	121.5 [36.1; 206.8]	111.1 [15.5;206.7]
p: value			0.6	0.29	0.23	0.41	0.75	0.47
sCD14 (µg/L)	DTG+3TC	2231.5 [1810.5; 2652.5]	2339.3[1913.35; 2765.2]	2240.7 [1858; 2623.4]	2262.9 [1822; 2703.7]	2261.2 [1953.9; 2568.6]	2271.2 [1931.3; 2611]	2097.02 [1825.2;2368.7]
	BIC/F/TAF	2518.1 [1874.3; 3162]	2581.9 [2015.2; 3148.5]	2584.6 [2193.9; 2975.2]	2294.9 [1777.1; 2812.7]	2390.1 [1826.2; 2954]	2343.5 [1794.5; 2892.6]	2360.8 [1996.5;2725]
p: value			0.65	0.57	0.08	0.32	0.710	0.64

Conclusion

Initiating ART with either DTG/3TC or BIC/FTC/TAF results in rapid viral suppression and a reduction in inflammation. The study found no significant differences between the dual and triple therapy regimens in the rate of inflammatory biomarker decay. These findings support the efficacy of both treatment strategies in managing inflammation and achieving viral suppression in ART-naïve individuals with HIV.

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