Dynamic Changes in the Peripheral Blood Monocytes Following Long-Acting Injectable CAB/RPV in PLWH

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BACKGROUND

The advent of long-acting (LA) injectable ART has transformed the conceptualization of ART. However, there is a need for real-world data on the impact of this novel approach on peripheral inflammation. The aim of this study was to investigate the dynamic changes in monocyte/macrophage subsets and their soluble activation markers in PLWH switching to LA injectable ART (CAB/RPV).

METHODS

The present study investigated the percentages of peripheral blood monocyte/macrophage and dendritic cell subsets (HLA-DR, CD14, CD16, CD11c, CD123) in samples obtained from PLWH before CAB/RPV (T0), after one (T1), six (T6) and twelve months (T12) by flow cytometry.

Moreover, a longitudinal evaluation of monocyte/macrophage activation markers (sCD14 and sCD163) was conducted.

Subsequently, each time point was compared to a control group (healthy donors, HDs).

RESULTS

A total of 30 aviremic PLWH switching to CAB/RPV, and 32 HDs were enrolled. All the enrolled PLWH were ART-experienced (12 dual/18 no dual) and 93.3% had a viral load of <50 copies/mL prior to initiating LA ART.

At T12, no virological failure was observed. At each time point, in comparison to HDs, PLWH exhibited higher percentages of intermediate monocytes (p=0.0037), non-classical monocytes (p<0.0001), M-DC8 (p=0.0007) and elevated plasma levels of sCD14 (p<0.0001) and sCD163 (p<0.0001) (Table 1).

A significant reduction in inflammation and peripheral immune activation monocyte compartment after 12 months of LA injectable CAB/RPV

RESULTS

Overall, at both T6 and T12, a significant reduction in the percentage of non-classical monocytes compared to T0 was observed (p=0.0054 and p=0.0017, respectively). No significant differences were observed in the percentages of classical monocytes, intermediate monocytes, M-DC8, pDCs and mDCs. Furthermore, a reduction in sCD14 plasma levels was observed at both T6 and T12 in comparison to T0 (p=0.0006 and p=0.0237, respectively). No differences in sCD163 plasma levels were observed (Figure 1).

The stratification of PLWH according to previous ART revealed no differences in the percentages of monocyte/macrophage subsets or in the plasma levels of sCD14 and sCD163 between dual and no dual therapy.

			PLWH (n=30)		HDs (n=32)
Age, years			47 (35-56)		51 (41-55)
Male/female			21/9		22/10
	T0	T1	T6	T12	
% of classical monocytes	55.7 (48.5-66.1)	57.7 (52.6-67.6)	57.8 (49.5-66.0)	53.4 (45.2-66.0)	52.2 (48.5-62.8)
% of intermediate monocytes	1.6 (1.4-1.9)	1.6 (1.3-1.9)	1.6 (1.4-1.7)	1.7 (1.3-1.9)	1.2 (1.1-1.7)
% of non-classical monocytes	2.3 (1.6-2.6)	2.3 (1.9-2.6)	1.8 (1.6-2.2)	1.8 (1.4-2.2)	1.3 (1.1-1.5)
% of M-DC8	2.9 (1.7-3.4)	2.3 (1.4-3.8)	3.1 (1.4-4.8)	2.3 (1.5-3.6)	1.2 (0.9-1.8)
% of myeloid dendritic cells (DCs)	44.3 (32.8-55.4)	42.9 (35.6-57.8)	42.3 (34.6-49.9)	44.0 (33.1-50.5)	43.6 (35.3-53.2)
% of plasmacytoid dendritic cells (DCs)	43.2 (31.3-57.9)	44.3 (29.8-56.6)	41.1 (33.7-54.3)	40.0 (33.5-58.9)	37.8 (31.3-42.6)
sCD14 (pg/ml)	1488 (1323-1816)	1579 (1262-1936)	1066 (729-1348)	1142 (1037-1568)	956 (804-1100)
sCD163 (pg/ml)	347 (286-437)	374 (290-541)	323 (255-507)	577 (322-669)	256 (230-290)

Table 1. Demographic and clinical characteristics of the study population

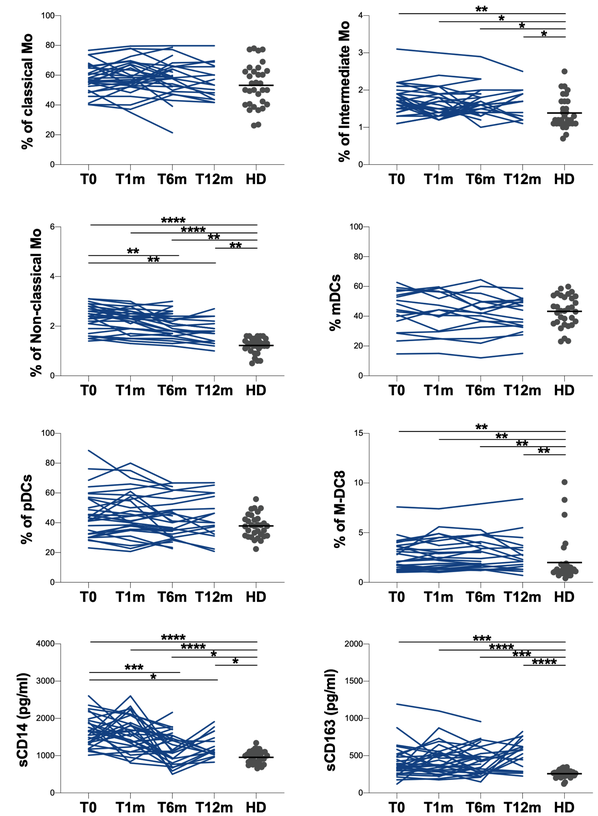


Figure 1. Peripheral blood monocyte/macrophage cells and monocyte/macrophage activation markers

CONCLUSIONS

The significant reduction in inflammation and peripheral immune activation of the monocyte compartment observed after 12 months of LA injectable CAB/RPV underlines that the potential contribution of these cells to the viral reservoir and persistence may vary with therapy. The constant drug concentrations provided by CAB/RPV injection appear to be sufficient for sustained virological suppression and may affect the monocyte/macrophage compartment in PLWH.

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