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**Effect of CMV viraemia on endothelial dysfunction over 42 weeks in Malawian adults initiating ART with advanced immune suppression**

Background

Advanced immune suppression in HIV is still common in low-income Sub-Saharan Africa. We characterised the effect of CMV viraemia on endothelial dysfunction over 42 weeks of ART in late presenters.

Methods

We recruited Malawian adults with CD4<100 cells/ul two weeks after starting ART (enrolment) in the REALITY trial (NCT01825031). CMV PCR and 22 inflammatory biomarkers were assessed at enrolment and 42 weeks later, along with carotid femoral pulse wave velocity (cfPWV). Logistic regression assessed predictors for CMV viraemia and cfPWV.

Results

61(32%) of 193 participants were CMV PCR+ at enrolment; 28(15%) had viral load >1000 copies/mL. Despite not receiving CMV specific treatment, 60(98%) participants became undetectable after 42 weeks’ ART.

At enrolment CMV viraemia showed significant positive correlation with IL1Ra, VCAM, ICAM, MIP1β, IP10, MCP1, IL8, IL10, TNFα (all ranksum p<0.001); VCAM (p=0.04) and MIP1β (p=0.01) remained significantly associated when adjusted for CD4 count (median 25 versus 45 cells/µL, p=0.02) and %activated CD8 T-cells (83% versus 71%, p=0.0003). At week 42, MIP1β remained significantly higher in those CMV PCR+ at enrolment (p=0.005. Figure 1).

There was no difference in cfPWV between those CMV PCR+ and PCR- at enrolment [median cfPWV 7.3m/s and 7.2, p=0.15 respectively]. There was a trend towards higher cfPWV for those with enrolment CMV viral load below compared to above 1000 copies/mL at both enrolment [median 7.7m/s and 7.2, p=0.06] and 42 weeks [7.5m/s and 6.6m/s, p=0.05]. However, this association did not persist when adjusted for age, blood pressure and haemoglobin (enrolment p=0.34 and week 42 p=0.13 respectively).

Conclusions

CMV viraemia was common but didn’t explain endothelial dysfunction at ART initiation. However, CMV viraemia at presentation was associated with persistent inflammation at 42 weeks. Whether treating CMV viraemia at presentation reduces long-term endothelial dysfunction on ART in this cohort remains unknown.

**Figure 1. Nine Inflammatory Biomarkers Raised in Patients with CMV Viraemia at ART Initiation and their Trajectory over 42 Weeks.**

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