Poster No.

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Depression is independently associated with increased HIV viral load in East African HIV care clinics

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♦ Background

People living with HIV (PLWH) suffer from depression at 3-5 times the prevalence of general populations. Depression is associated with decreased antiretroviral (ARV) adherence and increased viral load. Given the strong effect of ARVs on HIV viral load, adherence has been a primary focus for studies of depression among PLWH. However, studies suggest that depression may be associated with increased viral load through other pathways, as well (e.g., cognition, inflammation).

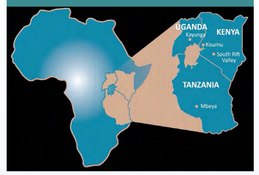
♦Aims

Much of the published literature examining associations between depression and viral load focuses on single mediators, such as ARV adherence or cognition (less frequently), rather than including and controlling for multiple potential mediators. We address this research gap by examining the relationship between depression and viral load in a robust dataset from the African Cohort Study (AFRICOS) that allows us to control for adherence and cognitive performance.

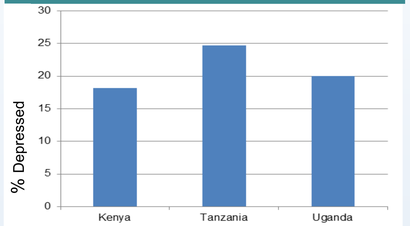
♦Methods

AFRICOS is a prospective, longitudinal cohort study of PLWH who are engaged in care at eleven HIV service sites in sub-Saharan Africa. We examined baseline data from East African sites (n=2,335). We analyzed baseline characteristics of AFRICOS participants including depression, which was measured using the Center for Epidemiologic Studies Depression Scale (CESD, 20 item version, established cutoff of 16 as an indicator of depression). We evaluated the relationship between ARV adherence and depression using logistic regression to model ARV adherence as a bivariate over the past month. We used linear regression to model the $\log_{10}$ HIV viral load among the sub-group of AFRICOS participants who had been on ARVs for 6 months or more. We included both past month adherence and a dichotomous measure of global cognitive impairment. Lastly, we conducted exploratory analyses of depression symptoms, by performing sequential linear regressions of $\log_{10}$ HIV viral load for AFRICOS participants that had been on ARVs for 6 months or more. Each CESD item for individuals was evaluated in a separate regression, controlling for ARV adherence and cognitive impairment. We presented the results as β coefficients with 95% confidence intervals (CIs).

Map of AFRICOS study sites in East Africa

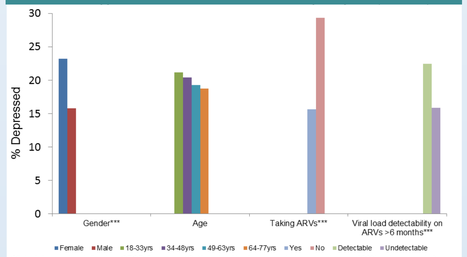


Clinical Depression* among AFRICOS Participants engaged in HIV Care, by Site (n=2,307)



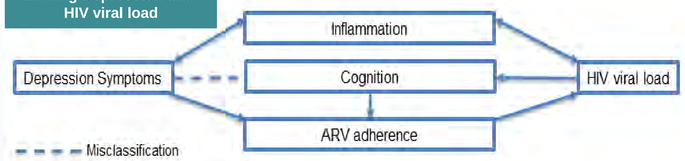
*Clinical depression defined as CESD-20 score ≥ 16. Note that Y axis was scaled to a maximum of 30% to improve clarity.

Clinical Depression by gender, age, ARV treatment status and HIV viral load suppression for those on ARVs: (n=2,307)



Clinical depression defined as CESD-R score ≥ 16. Note that Y axis was scaled to a maximum of 30% to improve clarity. Differences in depression prevalence between sub-groups for each category (e.g., female/male) were tested for significance. ***p < 0.001

Some Potential Pathways Linking Depression and HIV viral load



Logistic regression modeling ARV adherence over the past month (1= no missed doses; 0= doses missed, n =1,400)

	Odds Ratio [95% CI]	P value
Age	1.01 [1.00, 1.03]	0.10
Education	1.02 [0.91, 1.14]	0.70
Married	0.83 [0.59, 1.18]	0.30
Weekly income converted to purchasing power[a]	1.01 [1.00, 1.03]	0.13
Cognitive Impairment (1=impaired, 0=not impaired)*	1.58 [1.09, 2.27]	0.02
Depressed (1 = CESD ≥ 16 or 0 = CESD < 16)**	0.59 [0.39, 0.89]	0.012

[a]Income standardized across country sites.

Multivariate linear regression modeling $\log_{10}$ viral load among HIV+ participants on ARV for more than 6 months, controlling for past month ARV adherence and cognitive impairment (n= 1,380)

	β [95% CI]	P value
Age	-0.01 [-0.02, -0.01]	0.001
Education	-0.02 [-0.07, 0.03]	0.42
Married	-0.10 [-0.26, 0.08]	0.21
Weekly income converted to purchasing power[a]	-0.01 [-0.09, 0.08]	0.84
Past month ARV adherence (1=no missed doses, 0=missed doses)	-0.45 [-0.68, -0.19]	0.001
Cognitive Impairment (1= impaired, 0= not impaired)	0.18 [0.01, 0.34]	0.03
Depressed (1 = CESD ≥ 16, 0 = CESD < 16)	0.21 [-0.00, 0.43]	0.05

[a]Income standardized across country sites; HIV Viral Load (VL)

♦ Acknowledgements

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♦ Results

The point prevalence of depression is 18%-25% among study participants. Depression is associated with decreased ARV adherence (OR 0.39-0.88, p = 0.01) independently of cognitive impairment. Depression is associated with an approximate 60% increase of viral load independently of ARV adherence and cognitive impairment among participants who have been on ARVs ≥ 6 months.

♦ Limitations

This was a cross-sectional study of baseline data from a longitudinal study. The results cannot be used to determine causality. While the current study did not allow for direct investigation of immunological pathways, we look forward to the opportunity to assess the relationship between depression, viral load and immunological markers. Future research will leverage the longitudinal nature of this study to assess the predictive value depression on critical HIV outcomes.

♦ Conclusions and Future Research

Δ HIV+ East African AFRICOS participants enrolled in HIV care have high prevalence of depression.

Δ Depression is associated with viral load independently of pathways involved with ARV adherence or misclassification of cognitive impairment.

Δ Depression and HIV viral load is associated across a wide spectrum of depressive symptoms, implying that comprehensive depression treatment is necessary to fully address the relationship between HIV viral load and depression.

Δ Given the recent advances of integrated HIV and mental health services using local non-specialists in sub-Saharan Africa, key next steps include research on scalable, evidence-based depression treatment with careful assessment of impact on HIV outcomes.