HIV Infection, Systemic Inflammation, and Lung Function In Rural Uganda

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INTRODUCTION

RESEARCH QUESTION

What is the relationship between systemic inflammation and lung function among PLWH on stable antiretroviral therapy in rural Uganda?

- People living with HIV (PLWH) are at increased risk for chronic obstructive pulmonary disease (COPD)[1,2]
- Systemic inflammation/macrophage activation associated with lower lung function in U.S/European cohorts.[3-6]
- Relationship between biomarkers and lung function may be different in sub-Saharan Africa:
  - PLWH present for HIV care at advanced disease stages[7]
  - Air pollution is the major chronic lung disease risk factor, not smoking[8]

MATERIALS & METHODS

PRIMARY OUTCOMES

- **Pulmonary function (FEV_1 & FVC)**
- **Respiratory symptoms (cough, phlegm, dyspnea, wheeze)**

STUDY POPULATION

- Prospective cohort study
  - HIV+ : ≥ 40 years, on ART ≥ 3 years
  - HIV- : Age & sex matched to HIV+ (community-based)

STATISTICAL ANALYSIS

- Linear and logistic regression models, stratified by HIV serostatus
- Adjusted for age, gender, height, smoking history, and biomass exposure

	Total Cohort (n = 234)	HIV+ (n = 125)	HIV- (n = 109)
Age, years	52 [48, 55]	52 [49,56]	52 [48, 55]
HIV positive	125 (53)		
Female gender	107 (46)	56 (45)	51 (47)
Smoking History			
Ever Smoker	115 (49)	54 (43)	61 (56)
Never Smoker	119 (51)	71 (57)	48 (44)
Biomass (Firewood)	199 (86)	91 (74)	108 (99)
Mean CD4		472 [374, 622]	
Undetectable Viral Load		115 (92)	
ART duration, years		9 [8, 10]	
AZT/3TC/NVP or EFV		101 (81)	
Biomarkers			
High sensitivity CRP	0.8 [0.3, 2.3]	1.3 [0.6, 3.2]	0.4 [0.2, 1.0]
IL-6	0.4 [0.3, 0.6]	0.4 [0.3, 0.6]	0.4 [0.3, 0.5]
Soluble CD14	1329 [1061, 1593]	1458 [1163, 1720]	1214 [1010, 1405]
Soluble CD163	455 [351, 614]	445 [348, 619]	485 [360, 610]

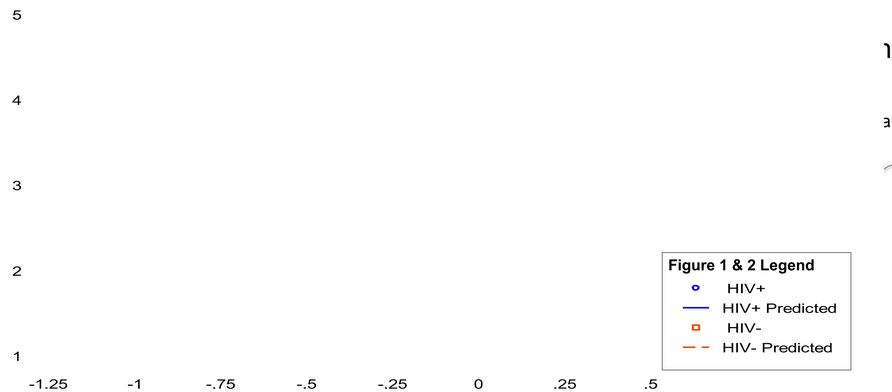


Figure 1. FEV_1 and Systemic Inflammation

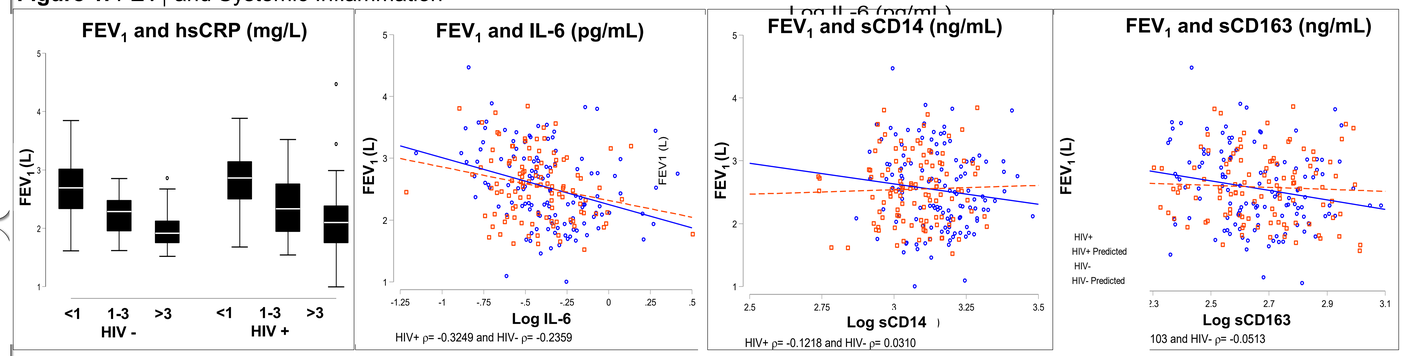


Figure 2. FVC and Systemic Inflammation

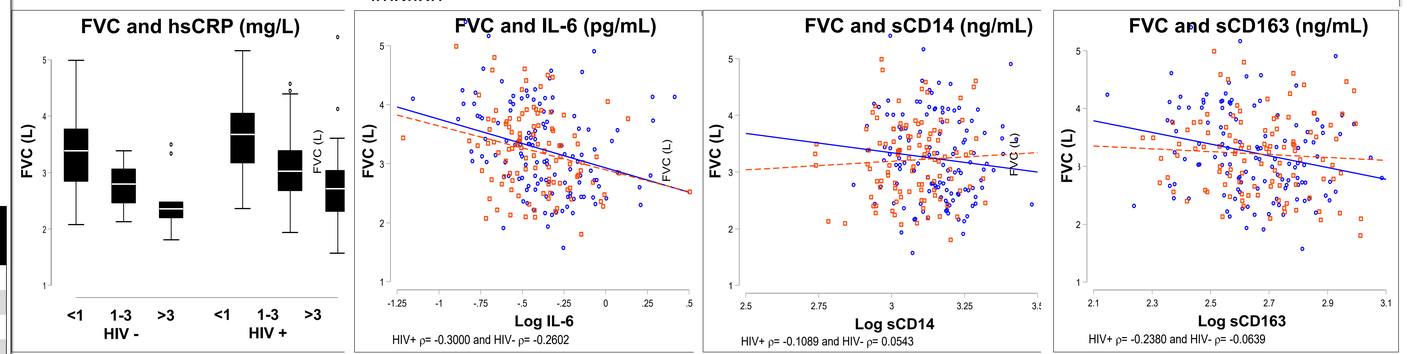


Table 1: Associations between lung function (mL) and serum biomarkers

	HIV+ (n=122†)		HIV- (n=108†)		Interaction Terms‡	
	FEV_1	FVC	FEV_1	FVC	FEV_1	FVC
IL-6, per IQR increase	**-18.1 (-29.1 to -7.1)****	**-17.1 (-28.2 to -5.9)****	-6.2 (-16.0 – 3.5)	-8.7 (-20.8 – 3.5)	0.44	0.74
sCD14, per IQR increase	2.3 (-11.7 – 16.3)	7.0 (-6.9 – 21.0)	6.2 (-4.3 – 16.6)	8.9 (-4.1 – 21.8)	0.74	0.94
sCD163, per IQR increase	-11.4 (-24.0 – 1.2)	**-14.3 (-26.9 to -1.7)***	-3.7 (-13.8 – 6.3)	-6.5 (-19.0 – 6.1)	0.41	0.48
hsCRP, >3mg/L vs. <1mg/L	**-39.3 (-61.7 to -16.9)****	**-44.0 (-48.4 to -6.4)*****	**-37.9 (-63.2 to -12.6)****	**-58.0 (-88.4 to -27.5)*****	0.75	0.38

*p < 0.05, **p < 0.01, ***p<0.001; † hsCRP model sample sizes: n=120 (HIV+) & n=107 (HIV-); ‡ *p* values for HIV*biomarker interaction terms

CONCLUSIONS

MAIN CONCLUSIONS

- **Increased systemic inflammation and macrophage activation are associated with decreased lung function among PLWH on stable antiretroviral therapy in rural Uganda**

TIONS

-sectional, small sample size

nic, not lung-specific biomarkers

imaging and DLCO measurements ilable

STEPS

gate relationship between systemic nation and longitudinal lung function

Evaluate influence of air pollution on the relationship between systemic inflammation and lung function

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