Interleukin-1β and Interleukin-10 Are Associated With Faster Lung Function Decline in Well-Treated People Living With HIV

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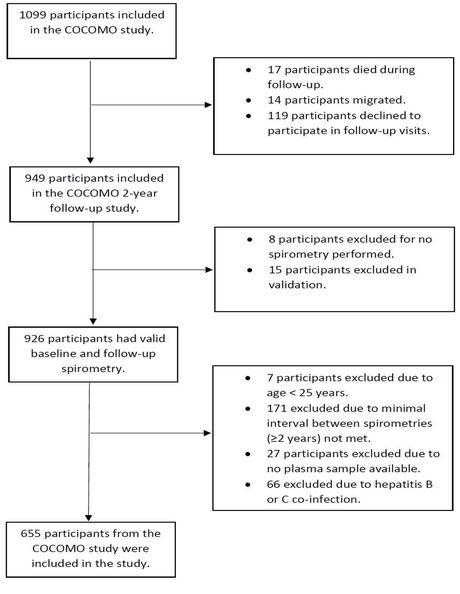
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BACKGROUND

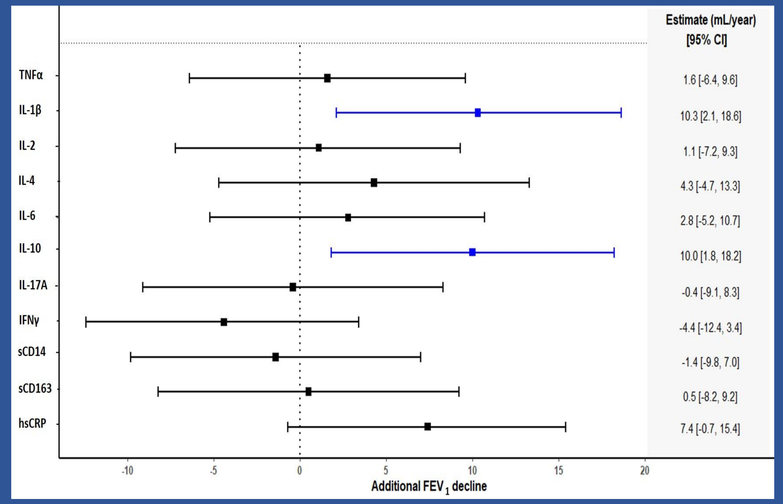
- People living with HIV (PLWH) have an increased risk of chronic lung diseases, but the pathogenesis is largely unknown
- **We aimed to investigate if markers of inflammation and monocyte activation are associated with faster lung function decline in PLWH.**

METHODS

- Lung function was assessed by spirometry at baseline and after 2 years of follow-up
- Blood was drawn non-fasting at baseline
- Inflammatory markers were dichotomized using third quartile as cut-off. Hs-CRP concentration above 2.0 mg//L was defined as elevated.
- Primary outcome of the study was FEV_1 decline in mL/year
- Secondary outcome was FVC decline in mL/year



Elevated concentrations of IL-1β and IL-10 is independently associated with faster FEV_1 decline in well-treated PLWH in a large longitudinal study



Linear mixed model for the additional FEV_1 decline (mL/year) in people living with HIV with elevated versus low concentration of the inflammatory markers listed on the y-axis. Blue color indicates a statistically significant finding.

	PLWH (n=655)
Age, median (IQR)	50.2 (43.4-58.6)
Sex (male), n (%)	558 (85.2)
Smoking status	
Current smokers, n (%)	176 (26.9)
Former smokers, n (%)	239 (36.5)
Never smokers, n (%)	223 (34.0)
HIV-related variables	
Current CD4 count per µL, mean (SD)	714 (284)
CD4 nadir <200 cells per µL, n (%)	267 (40.8)
Current ART use, n (%)	646 (98.6)
HIV RNA <50 copies/ml, n (%)	624 (95.3)
Time with HIV, years, mean (SD)	14.6 (9.0)

Pulmonary function	PLWH (n=655)
FEV_1 (L), mean (SD)	3.5 (0.8)
FEV_1 as % of predicted value, mean (SD)	91.3 (15.4)
FEV_1 ≥ 80% predicted, n (%)	529 (80.8)
FEV_1 50-79% predicted, n (%)	113 (17.3)
FEV_1 30-49% predicted, n (%)	10 (1.5)
FEV_1 <30% predicted, n (%)	2 (0.3)
FVC (L), mean (SD)	4.5 (1.0)
FVC ≥ 80% predicted, n (%)	553 (84.4)
FVC 50-79% predicted, n (%)	100 (15.3)
FVC 30-49% predicted, n (%)	1 (0.2)
FVC <30% predicted, n (%)	0 (0.0)
Airflow limitation, n (%)	
Fixed criterion	55 (8.2)
LLN	59 (9.0)

RESULTS

- FEV_1 decline was significantly faster in PLWH with elevated IL-1β or IL-10
- The findings remained significant in sensitivity analyses including only high quality spirometries, only PLWH who were virally suppressed and when cumulative smoking was added.
- FVC decline was significantly faster in PLWH with elevated IL-1β, IL-10 or hs-CRP
- There was a higher prevalence of elevated IL-10 in PLWH with elevated IL-1β

CONCLUSIONS

- In this large longitudinal study, elevated levels of IL-1β and IL-10 were independently associated with accelerated FEV_1 decline in PLWH receiving effective ART.
- IL-1β , IL-10 and hs-CRP were associated with accelerated FVC decline
- The findings support the hypothesis that inflammation in PLWH may play a role in the development of pulmonary diseases.
- IL-1β and IL-10 could have prognostic value in PLWH, though more knowledge on their clinical importance is needed.
- Studies that could clarify the role of IL-1β and IL-10 in the pathogenesis of lung disease in PLWH are warranted.

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