

Lung function and collagen 1a levels are associated with changes in six-minute walk test distance during treatment of TB among HIV-infected adults: a prospective cohort study

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INTRODUCTION

- A majority of tuberculosis (TB) cases complete treatment and are microbiologically cured
- Half of TB survivors suffer from post-TB sequelae, non-pulmonary as well as pulmonary etiologies
- Particularly true in HIV/TB co-infection patients who go through up and down of systemic immune activation and inflammation from both anti-tubercular and anti-retroviral therapies (ART)

OBJECTIVES

- To assess the overall functional capacity of TB/HIV patients
- To assess the associations between the functional capacity and immunological factors during the treatment course

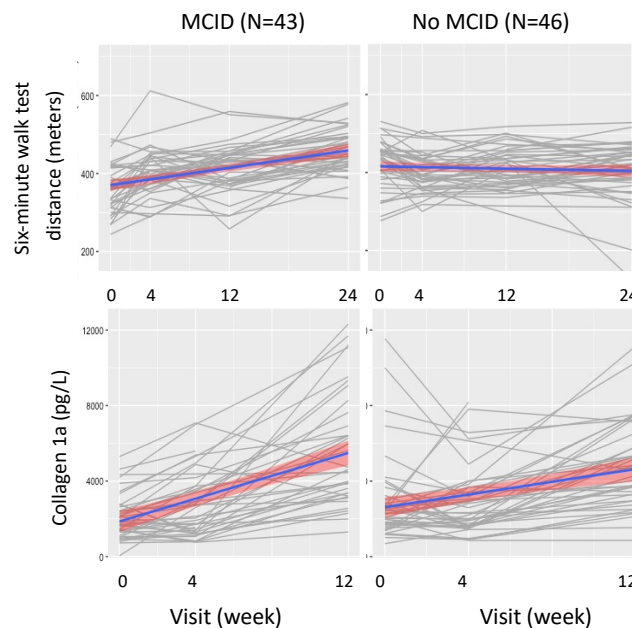
METHODS

- The study population is from a prospective cohort study, LIFT-IRIS, in Gauteng, South Africa
- Adult (>18y) patients newly diagnosed with TB and HIV were followed up from the ART initiation until 24 weeks
- Six-minute walk test and pulmonary lung function tests were measured at baseline, week 4, week 12, and week 24
- Twelve inflammatory biomarkers were measured at baseline, week 4, and week 12

PRIMARY OUTCOME

- Distribution-based minimum clinically important difference (MCID) in six-minute walk test distance from the baseline to week 24

RESULTS



Odds of experiencing MCID in the six-minute walk test distance vs. no MCID

	Baseline	Changes from baseline to week 4	Changes from baseline to week 24
Forced expiratory volume in 1 second (FEV ₁ , 100 mL)	0.94 (0.87, 1.00)	1.10 (0.99, 1.24)	1.17 (1.05, 1.33)
Collagen 1a (1,000 pg/L)	0.72 (0.49, 0.96)	1.32 (0.99, 1.83)	1.31 (1.08, 1.62)
TIMP1 (10,000 pg/L)	1.05 (1.01, 1.10)	1.00 (0.93, 1.07)	0.97 (0.91, 1.03)
CCL2 (100 pg/L)	0.89 (0.59, 1.34)	1.32 (0.75, 2.40)	1.41 (0.88, 2.35)
VCAM1 (1,000,000 pg/L)	1.28 (0.92, 1.85)	0.75 (0.50, 1.06)	0.69 (0.43, 1.06)
IL6 (10 pg/L)	0.83 (0.49, 1.25)	1.12 (0.93, 1.68)	1.13 (0.64, 2.15)
MCSF (10 pg/L)	1.03 (1.00, 1.07)	1.03 (0.98, 1.08)	0.99 (0.94, 1.03)

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- Of 89 patients, 43 patients (48%) experienced MCID
- Six-minute walk test distance increased by 28% from 257 to 457 meters in MCID
- Collagen 1a was the only biomarker whose levels increased over the treatment course
- Higher levels of TIMP-1 and MCSF, and lower levels of collagen 1a at baseline were associated with an increased odds of having an MCID
- Increasing levels of collagen 1a from baseline to both week 4 and 12 were associated with an increased odds of experiencing an MCID

CONCLUSION

- Substantial increases in the six-minute walk test distance occur within 24 weeks of HIV and TB treatment
- Larger increases in those who present with the worse disease before treatment
- Increases in the six-minute walk test distance were associated with baseline and changes in levels of biomarkers of inflammation and tissue remodeling, especially levels of collagen 1a