Mycobacterium Tuberculosis Associates with Higher HIV-1-Specific Antibody Responses

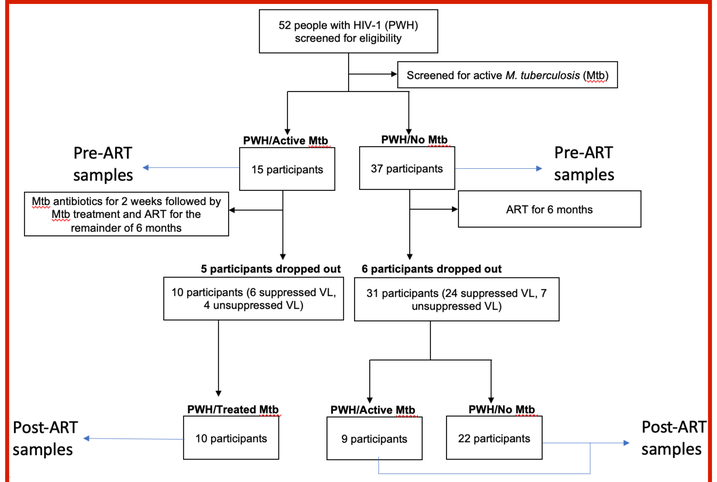
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BACKGROUND

Objectives: *Mycobacterium tuberculosis* (Mtb) has been shown to enhance antibody responses against diverse viruses. Thus, we hypothesized that active Mtb co-infection enhances the development of HIV-1-specific antibody responses.

METHODS



Pre-ART Characteristics of Two Groups

	PWH/Active Mtb (n = 15)	PWH/No Mtb (n = 37)	p-value
Age (years)	35 (19-48)	36 (21-56)	0.38
Gender # male (%)	9 (60)	15 (41)	0.20*
Log_{10} plasma virus (copies/ml)	5.5 (3.8 - 6.6)	5.5 (4.6 - 6.6)	0.96
CD4+ T cells (cells/mm^3)	141 (12-733)	32 (3-358)	0.03

All data are medians with range unless specified otherwise
p-values were computed with the Mann-Whitney test except as noted
*Chi-square test.

Post-ART Characteristics of Three Groups

	PWH/Prior Mtb (n = 10)	PWH/Active Mtb (n = 9)	PWH/No Mtb (n = 22)	p-value
Age (years)	33 (20 – 48)	37 (28 – 55)	36 (21 – 56)	0.51
Gender # male (%)	7 (70)	2 (22)	12 (55)	0.10*
Follow up log_{10} plasma virus (copies / ml)	2.0 (1.6 – 5.8)	1.6 (1.6 – 5.4)	1.8 (1.3 – 5.9)	0.27
# with log_{10} plasma virus < 1000 copies (%)	6 (60)	7 (78)	17 (78)	0.55*
Follow up CD4 + T cells (cells / mm3)	316.5 (41 – 693)	133 (19 – 431)	158 (20 – 580)	0.13

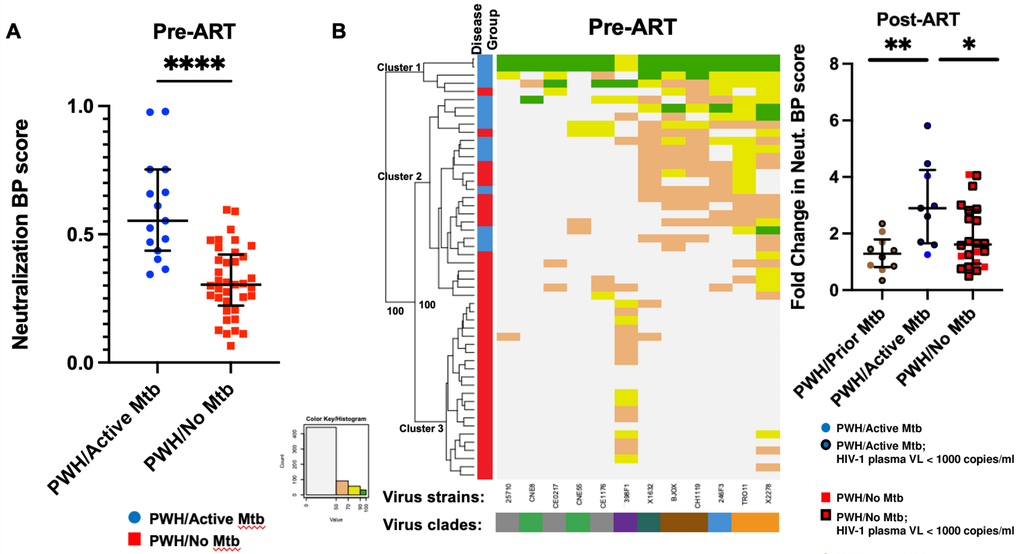
All data are medians with range unless specified otherwise
p-values were computed with the Kruskal-Wallis test except as noted
*Chi-Square test.

Degree of BP (Breath and Potency)

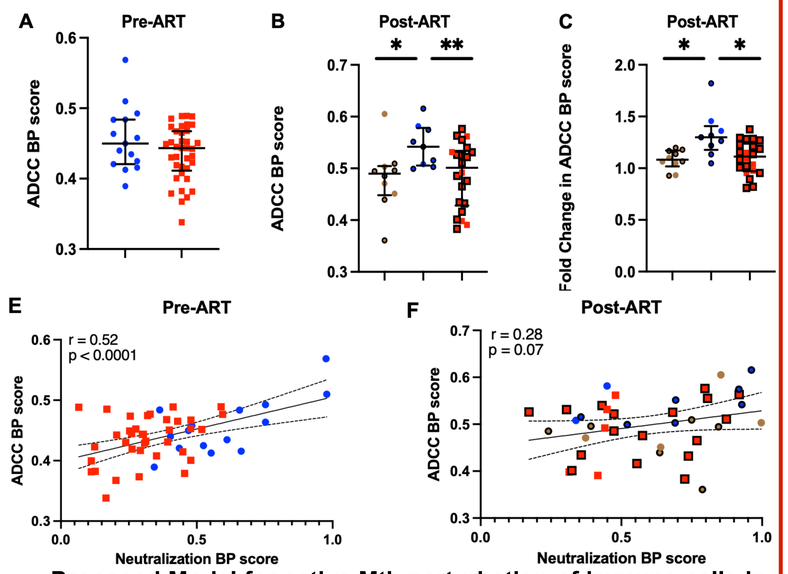
BP score of 0 (no neutralization or ADCC) → BP score of 1 (complete neutralization or ADCC)

RESULTS

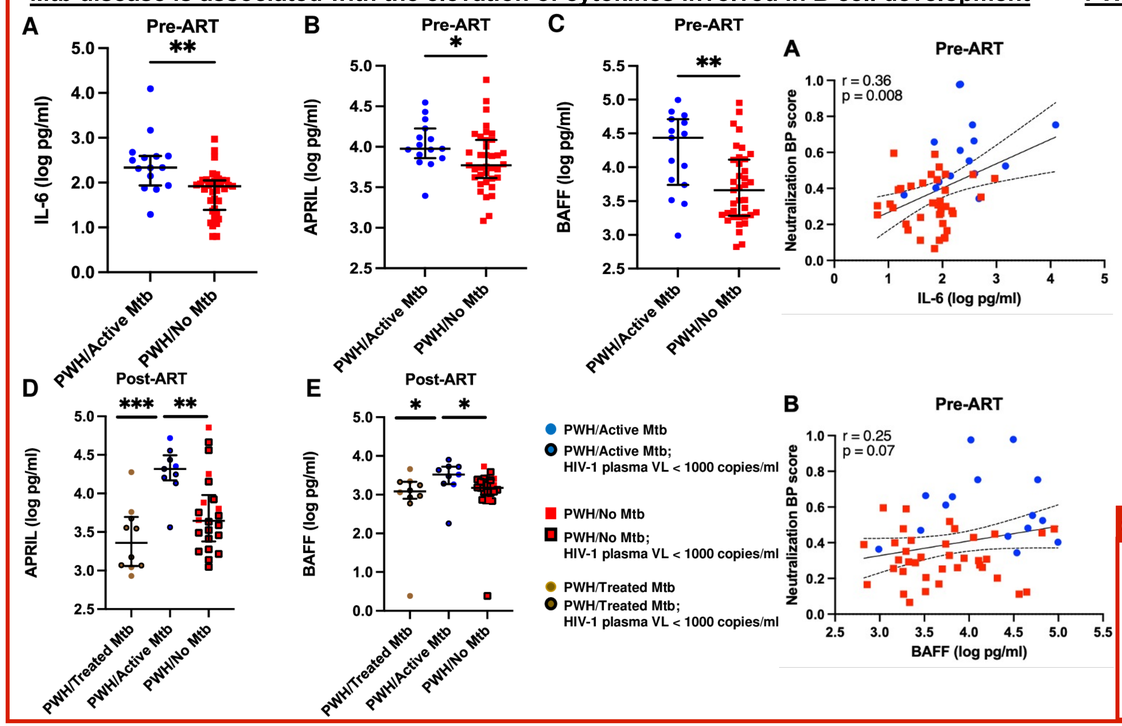
Mtb disease enhances anti-HIV-1 neutralization response before ART



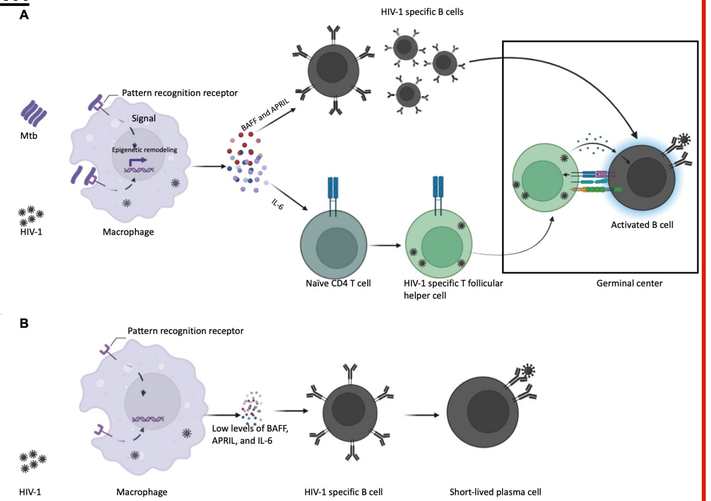
Mtb disease enhances antibody-effector function after starting ART



Mtb disease is associated with the elevation of cytokines involved in B cell development



Proposed Model for active Mtb perturbation of immune cells in PWH



CONCLUSIONS

Mtb-mediated upregulation of soluble mediators that impact lymph node germinal center activity may be associated with the emergence of broad and potent anti-HIV-1 antibodies. Dissecting mechanisms that account for the enhanced HIV-1 antibody responses in PWH/Active Mtb could be leveraged in the generation of more effective humoral responses in HIV-1 vaccination and treatment.