7TH GLOBAL FORUM ON TB VACCINES | 8-10 October 2024 Rio de Janeiro, Brazil
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QuantiFERON-Plus (QFT-plus) positivity in a large preventive treatment trial among people living with HIV (PLHIV) in 3 high TB-burden settings: implications for vaccine development in PLHIV

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Introduction: QuantiFERON (QFT) testing can help identify past exposure to M.tuberculosis (Mtb) and can be used as a proxy of current Mtb infection. Studying the kinetics of QFT responses can help us understand the burden of Mtb infection and annual rates of conversions/reversions. This information is relevant for the selection of vaccine trial sites and the design of prevention of infection vaccine trials. As a secondary analysis of the WHIP3TB trial (NCT02980016), a TB Preventive Treatment strategy trial, we assessed the prevalence of QFT positivity in PLHIV and 12-month conversion/reversion rates.

Methods: In Mozambique, Ethiopia, and South Africa, participants were randomly allocated to 1) a single 3-month course of rifapentine–isoniazid; 2) annual rifapentine–isoniazid courses for 2 years; 3) daily 6-month isoniazid. QFT testing was consistently performed at the 3 sites at Months 0 (M0) and 12 (M12). Conversion rate refers to the proportion of overall individuals who tested negative at M0 and positive at M12, and reversion to those who tested positive at M0 and negative at M12.

Results: Of 4014 participants, 3783 (94%) underwent QFT testing at M0 and 61% (2464/4014) at M12. At M0 and M12, QFT positivity prevalence was 43.5% and 44% in South Africa, 23.2% and 28.1% in Mozambique and 31.8% and 34.3% in Ethiopia, respectively (table 1). Conversion rates, M0 to M12, were 7.8% (176/2287) overall and were higher in Ethiopia (13.7%) compared to Mozambique (7.2%) and South Africa (5.2%). Reversions occurred in 7.1% (159/2248) of participants overall, 11.7%, 6.2% and 3.8% in Ethiopia, South Africa and Mozambique, respectively.

Conclusion: QFT prevalence and annual conversion/reversion rates provide insights into the dynamics of Mtb infection among PLHIV on TB preventive treatment in high TB/HIV burden countries. QTF prevalence and annual reversion/conversion rates must be considered in site selection, design, and sample size estimation of TB vaccine trials for PLHIV.

Funding Sources

The WHIP3TB trial was supported by the KNCV CHALLENGE TB project and the United States Agency for International Development (USAID).

Conflicts of Interest

None

Table 1. Distribution of QFT-plus positive results at each time point, overall and stratified by country.

	Total	% (95%CI)	Moz[1] (n)	% (95%CI)	SA[2] (n)	% (95%CI)	Eth[3] (n)	% (95%CI)
	4014		**599**	**14.9**	**2540**	**63.3**	**875**	**21.8**
QFT-plus baseline	3783	Coverage 94%*	596	99%*	2510	99%*	677	77%*
positive	1446	38.2 (36.7-39.8)	138	23.2 (19.9-26.7)	1093	43.5 (41.6-45.5)	215	31.8 (28.4-35.4)
QFT-plus M12	2464	61%*	473	79%*	1399	55%*	592	68%*
positive	952	38.6 (36.7-40.6)	133	28.1 (24.2-32.4)	616	44.0 (41.4-46.6)	203	34.3 (30.6-38.2)

Footnote: *coverage (proportion of tested); 1. Moz: Mozambique; 2. SA: South-Africa; 3. Eth: Ethiopia