High Levels Of Alcohol Use Associated With Latent TB Infection In HIV-positive Adults

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BACKGROUND

HIV infection and hazardous alcohol use are risk factors for tuberculosis (TB) disease, but it is unknown if TB infection varies by level of alcohol use among people living with HIV (PLWH).

OBJECTIVE

To examine associations between level of alcohol use and tuberculin skin test (TST) positivity among PLWH with hazardous alcohol use, to inform TB prevention.

METHODS

Study Population & Design:

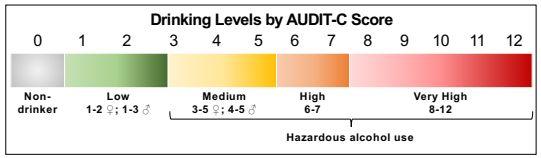
- Adults (age ≥ 18 years) who underwent TST placement between April 2018-July 2019 for enrollment into the Drinker's Intervention to Prevent Tuberculosis (DIPT) study (NCT03492216), an ongoing randomized controlled trial of economic incentives to reduce heavy alcohol use and improve isoniazid preventive therapy (IPT) completion in HIV/TB+ drinkers in Uganda
- Participants underwent TST screening if they were:
  - HIV+ on non-nevirapine ART ≥6 months
  - Reported no history of TB or IPT
  - Endorsed hazardous drinking and had a positive urine ethyl glucuronide test (alcohol biomarker)
- Participants were recruited from 2 urban and 2 rural clinic sites

Study Definitions:

- **Positive tuberculin skin test (TST):** induration ≥ 5mm at 48-72 hours after placement
  - TST results outside the window excluded
- **Latent TB infection**: Positive TST with a negative evaluation for active TB disease

Exposure Variables:

- Alcohol use was measured using the Alcohol Use Disorders Test-Consumption (AUDIT-C) for the prior 3 months
- **Hazardous use** (AUDIT-C ≥3 if female, ≥4 if male) **levels** stratified into
  - **Medium:** AUDIT-C 4-5 men/3-5 women
  - **High:** AUDIT-C 6-7
  - **Very-High**: AUDIT C 8-12



Analytic Methods:

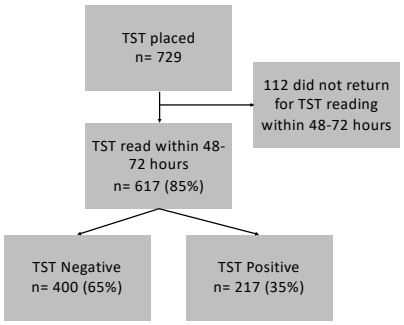
- Logistic regression with robust standard errors to evaluate associations between drinking levels and TST-positivity, adjusting for age, sex, and study site

Very-high level alcohol use is associated with *increased prevalence* of **latent tuberculosis infection** among HIV-positive adults in Uganda

RESULTS

- **217 (35%) HIV-positive adults with hazardous alcohol use met our definition for latent TB infection**.
- TST-positivity by drinking level was: medium 31%, high 33%, very high 45%
- In the multivariate model, very-high level use was significantly associated with TST- positivity compared to medium level drinking (aOR 1.61, 95%CI: 1.03-2.50, p=0.04).
- High level drinking had a non-significant association with TST-positivity compared to medium level use (aOR 1.05, 95%CI: 0.69-1.59, p=0.83).

Study Flow Diagram



Characteristics of participants

	Full cohort (n=617)	TST negative (n=400)	TST positive (n=217)
	N (%) or median (IQR)		
Male Sex	452 (73)	291 (72.8)	161 (74.2)
Age	40 (32-48)	39 (32-49)	40 (32-47)
AUDIT-C score	6 (5-8)	6 (5-6)	7 (5-8)
AUDIT-C level			
Medium	256 (41.5)	178 (44.5)	78 (35.9)
High	191 (31)	129 (32.3)	62 (28.6)
Very-high	170 (27.5)	93 (23.3)	77 (35.5)
Clinic			
Urban clinic 1	206 (33.4)	116 (29.0)	90 (41.5)
Urban clinic 2	62 (10.0)	40 (10.0)	22 (10.1)
Rural clinic 1	150 (24.3)	89 (22.3)	61 (28.1)
Rural clinic 2	199 (32.3)	155 (38.8)	44 (20.3)

RESULTS (cont.)

Predictors of Prevalent TB infection

	aOR (95% CI)	p-value
Female sex	0.97 (0.65, 1.43)	0.86
Age	0.99 (0.84, 1.16)	0.91
AUDIT-C level		
Medium	1.00	--
High	1.05 (0.69, 1.59)	0.83
Very-high	**1.61 (1.03, 2.50)**	**0.04**
Clinic		
Urban clinic 1	1.00	--
Urban clinic 2	0.79 (0.43, 1.44)	0.44
Rural clinic 1	1.03 (0.65, 1.63)	0.89
Rural clinic 2	**0.42 (0.27, 0.67)**	**<0.01**

CONCLUSIONS

- Very high-level alcohol use was associated with increased TST-positivity among HIV+ hazardous drinkers.
- Potential mechanisms of increased TB infection are unclear but may include more time spent in high transmission environments (e.g. bars) or high-risk social networks.
- Our findings suggest higher prevalence of latent TB may be a contributor to drinkers' higher risk of TB disease.
- These results underscore the importance of advancing TB prevention efforts for HIV+ drinkers.

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