Effect of Alcohol Use on Active TB Incidence Among PWH with Prior Receipt of TB Preventive Therapy

968

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BACKGROUND

- High-risk alcohol use is associated with increased risk of active tuberculosis (TB),[1] the leading cause of death among persons with HIV (PWH).
- TB preventive therapy (TPT) reduces the risk of active TB and is recommended for all PWH.
- We hypothesized that the rate of active TB would differ by level of alcohol use among PWH who received TPT.

METHODS

Study setting, participants, and data (2017-2022)[2-4]

- N=988 PWH on antiretroviral therapy (ART), 4 HIV clinics, Southwest Uganda, tuberculin skin test (TST) positive
- Sex, age, housing, smoking, household crowding, and CD4 count at prior study baseline
- Body mass index (BMI), high risk alcohol use, ART regimen, HIV viral suppression, and TPT adherence from prior study follow-up (t0, see below)
- *All received 6 months of TPT (isoniazid, 300 mg daily)*

Data collection (TRAC Study, 2022-2024)

- Chart reviews of follow up status (alive, active TB, not alive, or lost to follow up) conducted at HIV/TB clinics (two rounds, 2022 and 2024)

Variables

- Time at risk:
  - Begin (t0): 6 months following TPT initiation
  - End (t1): active TB diagnosis, last known TB-free visit, or death not known to be due to TB
- High-risk alcohol use at t0 (main predictor of interest):
  - Alcohol Use Disorders Identification Test – Consumption (AUDIT-C) ≥ 6, *or* alcohol biomarker phosphatidylethanol (PEth) ≥ 200 ng/mL

Statistical analysis

- We fit Cox models to estimate the adjusted hazard ratio (aHR) and 95% Confidence Interval (CI) for high-risk alcohol use (yes vs. no), for the outcome of developing active TB, adjusting for sex and age.
- We explored these potential confounders: HIV viral non-suppression, ART regimen, CD4 count, TPT completion (MEMS-based), body mass index (BMI), household crowding, and cigarette smoking.
- We explored interaction between sex and high-risk alcohol use on TB incidence.

The adjusted hazard ratio for active TB was 3.74 for High-risk alcohol use vs. No/low/medium risk alcohol use among N=968 PWH with prior TB preventive therapy in Southwest Uganda

RESULTS

- 968/988 (97%) persons found in follow up chart reviews

Table 1. Participant characteristics, N=968	N (%)
Prior baseline variables	
Sex=female	356 (36.8%)
Age, median (IQR)	40.0 (32.0-47.0)
Household crowding (# people/room), median (IQR)	1.2 (0.7-1.8)
Smoking=yes	213 (22.0%)
CD4 count, median (IQR)	626.5 (460.0-822.0)
Follow up variables (at t0)	
BMI, median (IQR)	21.7 (19.5-24.5)
High-risk alcohol use (PEth≥200 ng/mL OR AUDIT-C≥6)	410 (42.4%)
HIV/TB variables (at t0)	
HIV non-suppressed (viral load ≥200 copies/mL) = yes	32 (3.3%)
INST-based ART regimen=yes	500 (51.7%)
>90% TPT completion	634 (65.5%)

- Follow up time: 3229 person-years = average of 3.3 years per person
- TB incidence: **21 cases of active TB,** TB rate of 0.65% per person year

Table 2. TB incidence overall and by alcohol use.	TB cases/ person years	Incidence rate, per person year (95% CI)
All	21/3229	0.65% (0.42-1.00%)
High-risk alcohol use	16/1248	1.28% (0.79-2.09%)
No/low/medium risk alcohol use	5/1981	0.25% (0.11-0.61%)

RESULTS, cont.

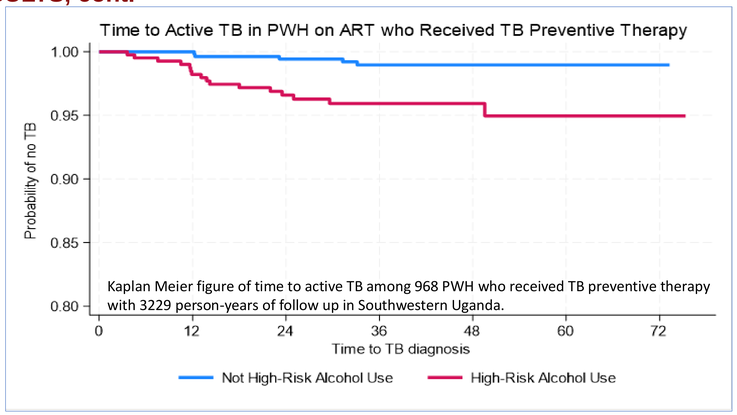


Table 3. Adjusted hazard ratios for active TB.	aHR (95% CI)	P-value
High-risk alcohol use (yes vs. no)	**3.74 (1.29, 10.79)**	**0.015**
Sex (=male)	1.21 (0.37, 3.98)	0.753
Age (per 1 year)	1.00 (0.96, 1.05)	0.846
Smoked cigarettes (=yes)	2.42 (0.99, 5.92)	0.053
HIV non-suppressed (=yes)	5.58 (1.64, 18.98)	0.006

- Other variables explored but not significant: ART regimen, CD4 count, TPT completion, BMI and household crowding (p>0.10).
- Interaction of sex and high-risk alcohol use in unadjusted model not significant (p=1.00).

CONCLUSIONS

- We found ongoing TB acquisition and/or reactivation among PWH, despite receipt of TPT and high rates of viral suppression. The rate was similar to the rate in a recent study of PWH receiving TPT in Uganda.[5]
- We found increased risk of TB among those with high-risk alcohol use, as well as among those with cigarette smoking and HIV non-suppression.
- Interventions that reduce alcohol use and smoking and boost viral suppression could reduce TB.
- Additional TB prevention therapy may be needed for certain groups, including PWH with high-risk alcohol use.

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ADDITIONAL KEY INFORMATION

- Contact us: judy.hahn@ucsf.edu and wmuyindike@gmail.com
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