Poster 3430

HOUSEHOLD AIR POLLUTION INCREASES RISK FOR PULMONARY TUBERCULOSIS IN HIV-INFECTED ADULTS

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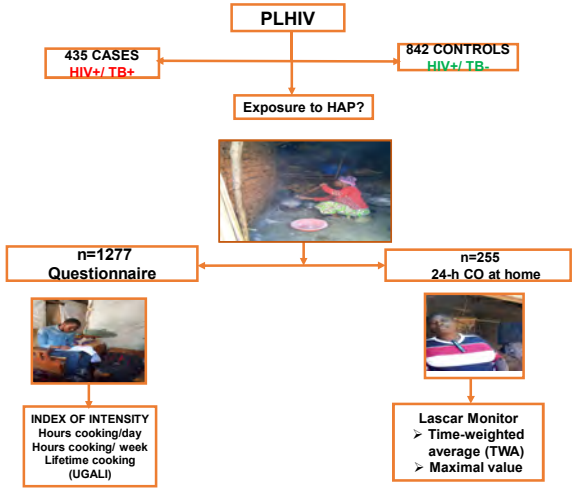
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BACKGROUND

- Each year, millions of deaths in low-income countries (LIC) are due to:
  - ✓ household air pollution (HAP),
  - ✓ pulmonary tuberculosis (PTB), and
  - ✓ HIV-infection
- Whether HAP influences the risk of PTB among people living with HIV (PLHIV) in LIC is unknown.

METHODS

- Case-control study among PLHIV at 4 clinics in DRC (03/2018 to 02/2019).
- Cases were ≥18 years old, with recent (≤5 years) or current PTB Controls were age- and sex-matched PLHIV with neither recent nor current PTB.
- HAP exposure was assessed by IMPALA questionnaire.
- Personal CO exposure was assessed by EasyLog USB CO Lascar Monitor, and volatile organic compound exposure using Radiello® passive-diffusive sampler.
- PTB confirmed by sputum smear or Xpert MTB/RIF positive
- Conditional multivariate logistic regression was performed to assess independent associations between HAP and PTB



RESULTS

- Each 1 ppm increase in average 24h CO exposure was positively associated with PTB (adjusted odds ratio, aOR; 95% confidence interval, CI: 1.5; 1.01-2.23)
- Average 24h CO level stratification by quintiles yielded a concentration-dependent increase in the odds of PTB from the lowest [0.1-1.9 ppm], to highest quintile [12.3-76.2 ppm] (aOR 4.64; 95%CI: 1.04-20.65) (Figure 1)
- Maximum and Time Weigheted Average (TWA) values of 24h average personal CO concentrations (median [IQR] ppm) did not differ significantly between cases (101 [52-223] and 6 [2-12], respectively) and controls (91 [47-155] and 5 [2-9], respectively) (Figure 2).

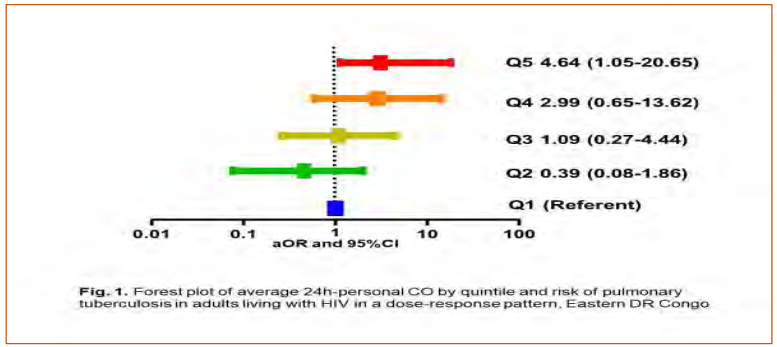


Fig. 1. Forest plot of average 24h-personal CO by quintile and risk of pulmonary tuberculosis in adults living with HIV in a dose-response pattern, Eastern DR Congo

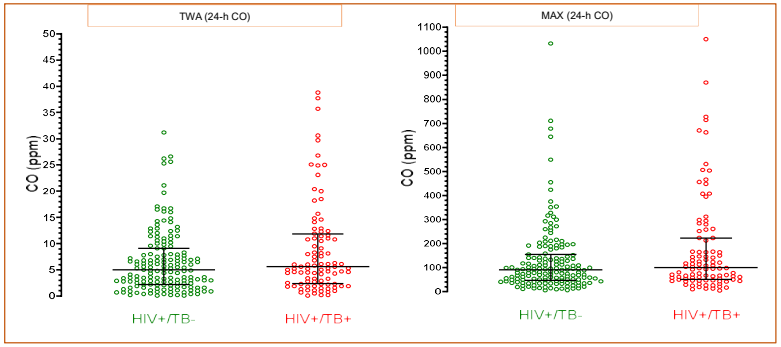


Fig. 2. Time Weighted Average (panel A) and maximum (panel B) personal CO concentrations over 24 h among cases (HIV+/TB+; n=96) and controls (HIV+/TB-; n=159).

RESULTS (Contd)

- Furthermore, for women, each additional hour spent cooking over wood fire was associated with increased odds of PTB (aOR 2.76; 95% CI: 1.02-7.47).
- Risk of PTB increases among older participants (>25 y since first ugali) "spending much time cooking": aOR 1.36 [1.01-1.84]; and among younger participants (<25 y since first ugali) using only "three stones" for cooking: aOR 4.05 [1.83-8.96]

CONCLUSIONS

- Personal CO exposure and time spent cooking over wood fire (among women) were independently associated with increased odds of PTB among PLHIV in eastern DRC.
- Longitudinal studies are needed to confirm our findings and inform comprehensive strategies to reduce the triple burden of HAP-TB-HIV.

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