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Background

- People with HIV (PWH) experience increased mortality at lower alcohol levels than people without HIV
- Data are mixed on alcohol's impact on absolute CD4 count after starting antiretroviral therapy (ART). CD4 recovery rate may be a better assessment of immune recovery.
- Self-reported alcohol consumption is often limited by social desirability and recall bias.
- Phosphatidylethanol (PEth) is a blood biomarker that measures the prior 3 weeks of ethanol intake

Objective

To assess alcohol's effect on CD4 count recovery rate after initiating ART

Methods

- **Design:** retrospective analysis of pooled Russia ARCH and St PETER cohorts of PWH in Russia
- **Inclusion criteria:** ART naïve at enrollment, initiated ART during the study period, and self-reported adherence $\geq 80\%$.
- **Primary exposure:** alcohol use at ART initiation by PEth. Categorized as low, moderate, and high consumption based on median PEth 80 ng/mL (<8, 8-80, and >80 ng/mL, respectively)
- **Secondary exposure:** alcohol use at ART initiation by self-reported heavy drinking days in the prior 30 days (Timeline Followback tool)
- **Outcome:** CD4 count recovery rate after initiating ART ("CD4 trajectory")
- **Analysis:** random effects piecewise linear regression to estimate the mean CD4 count at ART initiation and the slope of CD4 recovery by alcohol group

Results

Piecewise Linear Regression of CD4 Trajectory among Adherent Participants with Low, Moderate, and High Alcohol Consumption

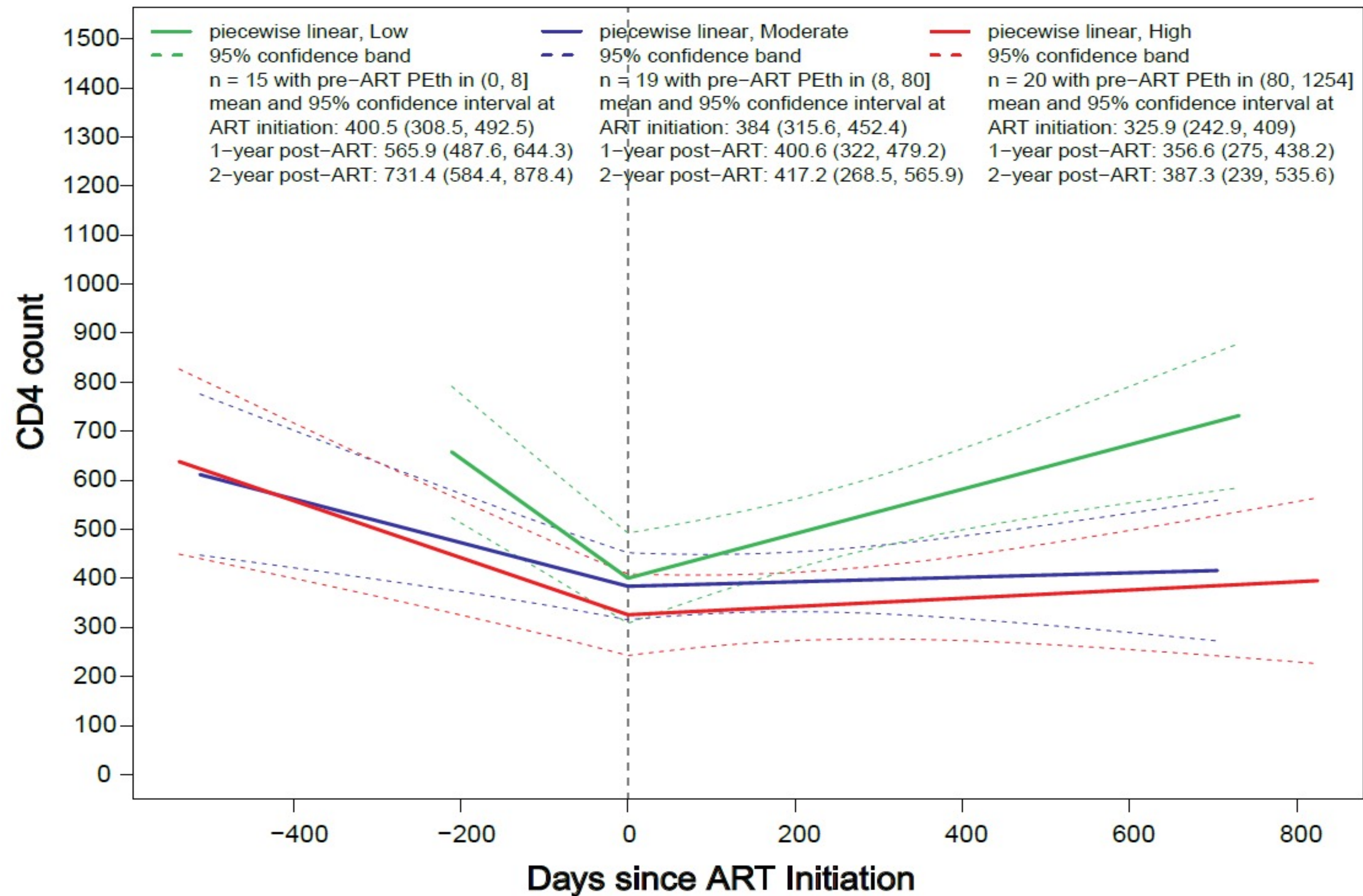


Figure. Change in CD4 count after ART initiation in participants with low (green), moderate (blue), or high (red) alcohol consumption by PEth. Time zero is time of ART initiation, and CD4 counts in the legend are model estimates.

Key findings:

- 54 included participants. Mean age was 35 year and 27% were female.
- Mean pre-ART alcohol consumption in the low, moderate, and high drinking groups: PEth 1, 30, and 339 ng/mL and monthly heavy drinking days 2.3, 4.8, and 7.4, respectively.
- CD4 counts at ART initiation in the low, moderate, and high drinking groups: 487, 433, and 393 cells/mm³, respectively.
- After starting ART, CD4 count increased monthly by 13.6 cells/mm³ (95% CI 0.33, 26.9) with low alcohol consumption, 1.37 cells/mm³ (95% CI -5.62, 8.35) with moderate consumption, and 2.52 cells/mm³ (95% CI -3.98, 9.02) with high consumption.

Conclusions and Limitations

- Among Russians with HIV, we observed faster CD4 recovery after ART initiation in those with low compared to moderate and high alcohol consumption
- Slowed CD4 recovery rate is a novel potential mechanism for the increased mortality in PWH who drink alcohol
- The single region may limit generalizability.
- We limited this study to participants with high self-reported ART adherence but acknowledge that over-estimated adherence in any alcohol group may result in slowed CD4 recovery in that group from inadequate ART rather than from alcohol
- Future studies will use continuous alcohol measures to assess the threshold above which CD4 recovery slows and will evaluate associations between alcohol and other cell counts and the presence of clinical infections.

Contact and Funding

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Dr. McLaughlin is supported by the BU-CHART T32, NIAID grant #T32AI052074.