Dose-response association between salivary cotinine levels and *Mycobacterium tuberculosis* infection

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**Background**
- Cigarette smoking might increase the risk for *Mycobacterium tuberculosis* (Mtbb) infection, but no studies on this topic have used biochemical measures of smoking
- Improved understanding of this relationship is needed to inform specific integrated interventions targeting smoking and TB

**Objectives**
- To describe the association between salivary cotinine (a biochemical measure of smoking status) and Mtbb infection among persons who inject drugs in Tijuana, Mexico.

**Methods**
- **Study Design:** Cross-sectional survey
- **Study Population**
  - N=234
  - ≥18 year-old Tijuana residents
  - Recent history of injecting drugs
  - Recruited using community-based outreach
- **Measures**
  - **Exposure:** Salivary cotinine levels using Nicalert, a semi-quantitative dipstick assay (0-6)
    - 2-6: Active smoking
    - 1: Secondhand smoke exposure or light smoking
    - 0: No smoking
  - **Outcome:** IFN-γ concentrations using QuantiFERON-TB Gold In-Tube (QFT) ≥0.35 IU/ml cutoff

**Table. Factors associated with QFT positivity in log binomial regression models**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bivariate Model Prevalence Ratio (95% CI)</th>
<th>Final Model Prevalence Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Categorical Models</strong></td>
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<td></td>
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<tr>
<td>Cotinine levels (categorical)</td>
<td></td>
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</tr>
<tr>
<td>0 (non-smoking)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>1 (secondhand smoking/light smoking)</td>
<td>1.10 (0.57, 2.13)</td>
<td>1.23 (0.64, 2.38)</td>
</tr>
<tr>
<td>2-6 (active smoking)</td>
<td>1.55 (0.91, 2.65)</td>
<td>1.58 (0.92, 2.69)</td>
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<tr>
<td><strong>Ordinal Models</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotinine levels (ordinal)</td>
<td>+1 level</td>
<td>1.09 (1.02, 1.16)</td>
</tr>
<tr>
<td>Education</td>
<td>Prep school or higher</td>
<td>1.00</td>
</tr>
<tr>
<td>Secondary school or lower</td>
<td>1.35 (1.01, 1.80)</td>
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</tbody>
</table>
| **Conclusion** | Cotinine levels were not associated with QFT positivity when included as smoking categories (1 and 2-6 vs. 0), but were independently associated with QFT positivity as an ordinal variable
- Our findings suggest that a dose-response relationship exists between tobacco smoke exposure and M. tuberculosis infection.
- Longitudinal studies that use biochemical measures for smoking status are needed to confirm our findings.

**Acknowledgements**
- We thank the study participants and *Proyecto El Cuete* staff, especially Socorro Martinez and Salvador Rodriguez.
- We also thank Dr. Cecilia Villa-Rosas, Dr. Carolina del Portillo-Mustieles, and Maria Luisa-Volker-Soberanes at the Tijuana General Hospital Tuberculosis Clinic for laboratory support.
- This study was supported by U.S. National Institute on Drug Abuse (NIDA) Award R37DA019829 (parent study, *Proyecto El Cuete*), R36DA033152 (Dr. Shin), and R01DA031074 (Dr. Garfein).