Latent tuberculosis infection and associated risk factors among people living with HIV and HIV-uninfected individuals in Lithuania

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BACKGROUND

People living with HIV (PLHIV) with latent tuberculosis infection (LTBI) are at increased risk for tuberculosis (TB) reactivation compared to HIV-negative population. Lithuania belongs to the 18 high-priority TB countries in the European region.

PURPOSE

To compare the prevalence of LTBI and LTBI-related risk factors between PLHIV and HIV-negative population.

METHODS

A cross-sectional study was conducted in three geographically distinct Lithuanian Infectious Diseases centres in Vilnius, Klaipeda and Siauliai from 08/2018 to 05/2022. PLHIV 18-65 years of age, first seen in an HIV centre after 01/2012, and the comparison group made up of HIV-negative population, frequency matched to PLHIV by age and gender, were included in the study.

Participants were tested for LTBI using interferon-gamma release assay (IGRA) followed by tuberculin skin test (TST) in Vilnius and with IGRA only – in Klaipeda and Siauliai. A structured questionnaire was completed by study participants to determine LTBI related risk factors. The primary outcome was evaluated by the presence of LTBI diagnosis with positive IGRA.

Statistical analysis: logistic regression was used to assess the factors associated with LTBI. Cohen’s kappa was used to determine IGRA and TST agreement.

RESULTS

- 390 PLHIV and 443 HIV-uninfected individuals enrolled, median age 41 (IQR 36-48) and 43 (IQR 36-50), 69.7% and 65.5% male, respectively (Table).
- In the PLHIV group, median CD4 count was 275 (IQR 268.5-272.5) cells/μl, 60.6% of patients had undetectable (<200 copies/ml) viral load and 67.4% had started ART at time of LTBI test.
- The prevalence of LTBI defined by positive IGRA among PLHIV was higher compared to HIV-negative population (17.9% vs. 11.1%, OR 1.62, 95%CI 1.16-2.28, p<0.005).
- The rate of positive LTST among PLHIV and HIV-negative population was 22/24 (9.1%) vs. 24/197 (12.2%), p=0.29, respectively.
- Concordance between IGRA and TST was fair: kappa=0.2 (95%CI 0.07-0.40).
- In multivariable analyses, association with intravenous drug use (ORa 2.45, 95%CI 1.09-5.49, p=0.03) in PLHIV and a history of a TB patient (ORa 3.08, 95%CI 1.26-7.53, p=0.01) in HIV-uninfected individuals were the only significant associations with LTBI (Figure).

LIMITATIONS

The limitation of this study is related to the relatively small sample size which may limit power to assess factors associated with LTBI.

CONCLUSIONS

The prevalence of LTBI among PLHIV in Lithuania is higher compared to HIV-uninfected population and European average. The association with IDUVD in PLHIV emphasizes the need for integrated HIV/HCV/TB and substance abuse treatment to provide patient-centred care.

ACKNOWLEDGEMENTS

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Table. Sociodemographic and clinical characteristics of study participants (n=833)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>PLHIV with LTBI (n=700), n (%)</th>
<th>PLHIV without LTBI (n=320), n (%)</th>
<th>P-value</th>
<th>HIV-uninfected individuals with LTBI (n=443), n (%)</th>
<th>HIV-uninfected individuals without LTBI (n=393), n (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male (70.0) vs. female (30.0)</td>
<td>202/416 vs. 98/206</td>
<td>0.194</td>
<td>360/393 vs. 230/443</td>
<td>364/394 vs. 230/443</td>
<td>0.318</td>
</tr>
<tr>
<td>Age</td>
<td>&lt;40 years (67.8) vs. ≥40 years (32.2)</td>
<td>153/277 vs. 138/42</td>
<td>0.019</td>
<td>66/193 vs. 287/250</td>
<td>66/190 vs. 275/250</td>
<td>0.003</td>
</tr>
<tr>
<td>Educational status</td>
<td>No University (69.8) vs. University (30.2)</td>
<td>234/366 vs. 77/244</td>
<td>0.212</td>
<td>248/395 vs. 78/250</td>
<td>248/392 vs. 78/250</td>
<td>0.136</td>
</tr>
<tr>
<td>Unemployment</td>
<td>Yes (9.9) vs. no (90.1)</td>
<td>36/414 vs. 686/416</td>
<td>0.019</td>
<td>42/395 vs. 348/443</td>
<td>42/392 vs. 346/443</td>
<td>0.002</td>
</tr>
<tr>
<td>History of TB</td>
<td>Positive (13.2) vs. no (86.8)</td>
<td>22/167 vs. 677/660</td>
<td>0.031</td>
<td>27/264 vs. 294/443</td>
<td>27/261 vs. 293/443</td>
<td>0.890</td>
</tr>
<tr>
<td>HIV-positive</td>
<td>Yes (58.3) vs. no (41.7)</td>
<td>419/707 vs. 275/660</td>
<td>0.001</td>
<td>375/707 vs. 259/660</td>
<td>375/705 vs. 259/660</td>
<td>0.005</td>
</tr>
<tr>
<td>Smoking</td>
<td>No (9.1) vs. yes (90.9)</td>
<td>30/365 vs. 396/707</td>
<td>0.009</td>
<td>30/397 vs. 365/707</td>
<td>30/395 vs. 364/707</td>
<td>0.001</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>Yes (6.8) vs. no (93.2)</td>
<td>9/136 vs. 690/707</td>
<td>0.035</td>
<td>10/136 vs. 680/707</td>
<td>10/134 vs. 679/707</td>
<td>0.032</td>
</tr>
</tbody>
</table>

Figure. Multivariable analysis* of factors associated with LTBI among PLHIV and HIV-uninfected individuals in Lithuania.