High Rates of Recent HIV-1 Infections Among Male Attendees of Public STI Clinics in Mumbai Are Associated with Visits to Commercial Sex Workers

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BACKGROUND

HIV/AIDS in India
- 2.5 million persons living with HIV in 2006 (UNAIDS)
- Adult national HIV prevalence in 2006 was 0.36%
- Mumbai: capital of southern state of Maharashtra
  - Center of sex trafficking in India (UNAIDS, 2007)
  - National Sentinel Surveillance 2006 (NACO, 2007)
  - HIV prevalence among risk groups:
    - 36.8% - female sex workers
    - 21.2% - sexually transmitted infections (STI) clinic patients

Objective
- To estimate HIV-1 incidence among high-risk men attending public STI clinics in Mumbai.
- To characterize risk factors associated with recent HIV-1 infection.

METHODS

Study Design
- Male patients at two public STI clinics in Mumbai from 2002 to 2004 were evaluated for HIV infection.
- Bombay Municipal Clinic (BMC):
  - N=1,701: 214 HIV-positive, 12.6% prevalence
- Lokmanya Tilak Municipal General Hospital (LTMG):
  - N=1,702: 131 HIV-positive, 7.7% prevalence
- HIV screening was performed using enzyme immunoassay (EIA) and confirmed by Western Blot.
- HIV-1 antibody positive specimens were evaluated for recent HIV-1 infection using the BED immunoglobulin capture EIA (BED-CEIA).
- Normalized optical density threshold cutoff ≤ 0.8
- Mean window period = 155 days
- 303 of 345 HIV-1 positive specimens tested
- 31 samples with OD values < 0.3 re-tested by EIA
- Data on HIV risk behavior were collected through routine pre-testing counseling sessions.

Data Analysis
- HIV-1 incidence estimates were calculated using revised formula (McDougal, 2006) that adjusted for:
  - Misclassification of long-term & recent infection
  - Missing data
- Associations between recent HIV-1 infection and risk factors were assessed using the Chi-square test.

RESULTS

HIV-1 Incidence
- HIV-1 incidence was 6.81% [95%CI: 5.42-8.21]
  - Adjusted from 7.75%
  - EIA re-testing detected 16 false positives (5%), which would yield an overestimate of 8.12%
  - Seroincidence was higher at BMC than LTMG
  - 10.67% vs. 3.16%; p=0.001

Risk Factors
- Recent HIV-1 infection did not vary significantly by age (p>0.05)
  - However, the highest proportion observed was among men over 40 years old (4.2%)
- No association with recent HIV-1 infection status
- Perception of being at risk for contracting HIV/AIDS (p>0.05)
- Being worried about contracting HIV/AIDS (p>0.05)

Predictors of Recent HIV-1 Infection

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Recent HIV-1</th>
<th>HIV Negative</th>
<th>Odds Ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting CSW</td>
<td>97%</td>
<td>90%</td>
<td>5.13</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>&gt;50 Lifetime CSW Visits</td>
<td>27%</td>
<td>13%</td>
<td>2.22</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Any STI History</td>
<td>91%</td>
<td>62%</td>
<td>6.56</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Genital Ulcerative Disease History</td>
<td>33%</td>
<td>14%</td>
<td>3.04</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HSV-2 History</td>
<td>75%</td>
<td>43%</td>
<td>3.38</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Recurrent HSV-2 History</td>
<td>35%</td>
<td>22%</td>
<td>1.95</td>
<td>0.01</td>
</tr>
<tr>
<td>Genital Warts History</td>
<td>10%</td>
<td>3%</td>
<td>4.12</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

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