TB and Correctional Facilities

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Disclosures

• No financial disclosures
• No off-label or experimental medication discussions
• All data slides, unless otherwise indicated, are from a CDC slide set entitled “Epidemiology of Tuberculosis in Correctional Facilities, United States, 1993-2011.”
Objectives

• Highlight the differences in TB epidemiology between correctional facilities and the US general population

• Briefly review an outbreak contact investigation to illustrate both the problems of, and opportunities for, the prevention and control of tuberculosis in correctional facilities
Epidemic of Incarceration

In 2010, 2.3 million persons were incarcerated in the U.S.
Epidemic of Incarceration

• Untreated mental illness and substance abuse

• Deinstitutionalization / dissolution of mental health care facilities

• Criminalization of drug use
  • War on Drugs (mandatory minimum sentencing, etc)

• Incarceration of illegal immigrants
Correctional Facilities

- **Jails**
  - Usually administered by local law enforcement
  - Usually pretrial & inmates with < 1 year sentence
- **State prisons**
  - Sentenced inmates
- **Federal prisons**
  - Pretrial & sentenced inmates related to federal crimes
Private Correctional Facilities

- Private companies contract with governments that pay a per diem or monthly rate per prisoner.

- Privatization refers to:
  - Management of existing public facilities by private operators.
  - Building and operation of new and additional prisons by for-profit prison companies.

- In 2010, 12.7% of federal inmates and 7.5% state inmates were housed in privately run facilities.
Federal Correctional System

- Federal Bureau of Prisons (FBOP)
  - 132 facilities (includes 16 contract facilities)
  - Average census 2012: 217,000 (25% foreign born)

- U.S. Marshals Service (USMS)
  - Responsible for inmate transport
  - Contracts with ~1800 correctional facilities (often local jails)
  - Detained prisoners in 2010: 225,329
Federal Correctional System

- U.S. Immigration and Customs Enforcement (ICE) (Formerly Immigration and Naturalization Service)
  - 11 detention facilities (includes 5 contract facilities)
  - Contracts with ~240 additional correctional facilities (often local jails)
  - Removals (deportations) in FY2010: 392,862 (100% foreign born)
Question #1: Which of the following is not a risk factor for TB transmission in prisons?

• Crowded living conditions
• Geographic location of the prison
• HIV seroprevalence of the population
• Percent of population with prior BCG immunization
• Lack of an effective intake screening program
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Geographic Relation #1

• Correctional facilities are high TB incidence settings often located in low incidence communities that lack TB expertise.
  • Community physicians and hospitals seeing few or no cases of TB per year are less likely to consider TB early in the differential diagnosis of pulmonary infections
Geographic Relation #2

• Correctional facilities in border states are high TB incidence settings.
  • Many of these correctional facilities are ICE detention facilities, large county jails (e.g. Los Angeles, Maricopa) and Federal Detention Centers (L.A., San Diego, Houston, Miami, New York)
TB Case Rates,* United States, 2010

*Cases per 100,000.

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Percent of TB Cases by HIV Status and Correctional Facility Status, 1993–2011

<table>
<thead>
<tr>
<th>HIV Status</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>45</td>
</tr>
<tr>
<td>Indeterminate</td>
<td></td>
</tr>
<tr>
<td>Refused</td>
<td></td>
</tr>
<tr>
<td>Not offered</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>40</td>
</tr>
</tbody>
</table>

- TB Cases not in Correctional Facilities
- TB Cases in Correctional Facilities
Question #2: True or False

• The incidence of TB cases in the United States is higher in foreign-born persons than in U.S.-born individuals.
Question #2: True
Number of TB Cases in U.S.-born vs. Foreign-born Persons, United States, 1993–2010

No. of Cases


U.S.-born  Foreign-born
Question #3: Vote A for Yes, B for No

• In my office practice, I would hospitalize the following patient:

• 37 year old Hispanic cab driver with a cough greater than 4 weeks, sputum streaked with blood on occasion, questionable fever off and on (unmeasured by patient, temp in office is 99.0), soaking night sweats.

• New patient, no baseline weight, patient says he works three jobs so maybe his pants are loose because of stress.
Tuberculosis & Incarceration

• Inmates at high risk for TB:
  • HIV, foreign birth, substance abuse, lower socio-economic status

• Congregate setting
  • overcrowding / poor ventilation

• Frequent inmate movement

• 1997 estimate: 40% of TB cases passed through a correctional facility\(^1\)

Tuberculosis & Incarceration

• Numerous outbreaks in correctional facilities reported in literature with evidence of transmission to nearby communities\(^1,2\)

• Outbreaks frequently associated with delay in diagnosis of active TB

• Crowding associated with higher incidence of TST conversion\(^3\)


\(^2\) CDC. Tuberculosis Transmission in Multiple Correctional Facilities --- Kansas, 2002—2003. MMWR 53(32) 734-738

\(^3\) MacIntyre CR, Kendig, et al. CID 1997;24:1060-1067.
Prevention and Control of Tuberculosis in Correctional and Detention Facilities: Recommendations from CDC

Endorsed by the Advisory Council for the Elimination of Tuberculosis, the National Commission on Correctional Health Care, and the American Correctional Association
CDC 2006 Corrections Guidelines

- **Screening**
- Isolation in an Airborne Infection Isolation Room
- Environmental Controls, Respiratory Protection
- *Diagnosis and Treatment of Latent Tuberculosis Infection and Tuberculosis Disease*
- Discharge Planning
- **Contact Investigation**
TB Symptom Screening

- All Inmates:
  - At Intake – TB Symptom Screen
    - Cough
    - Coughing up blood
    - Fever
    - Night sweats
    - Chest pain
    - Unexplained weight loss

- (In one observational study, these questions were asked correctly only 28% of the time)
If TB Symptoms

• Place in Airborne Infection Isolation Room
• Obtain Tuberculin Skin Test (TST) or Interferon Gamma Release Assay (IGRA)
• Chest x-ray
• Sputum, if indicated
MDR-TB in a Federal Pretrial Facility

• 57 year old Tijuana taxi driver crossed Mexico border into U.S.
  • Picked up by Customs and Border Protection
  • Immediately hospitalized with alcoholic hepatitis
  • History of Type II Diabetes on metformin. Started prednisone → insulin dependence

• One week later moved to MCC
  • Portable chest x-ray (CXR) read as “negative”. No TB symptoms
MDR-TB in Federal Pretrial Facility

- Three months later diagnosed with pulmonary tuberculosis
  - Cavitary CXR, AFB smear positive
  - Cough x previous 6 weeks with hemoptysis
  - Two months later: Susceptibility Results →
    - Resistance to rifampin, isoniazid, pyrazinamide, streptomycin
    - Re-read of initial CXR: “subtle evidence of upper lobe disease”

- Index case housed on 120 bed unit during infectious period:
  - total of 131 days
  - including 41 days after returning from initial hospitalization on standard 4-drug therapy.
- Very high turnover
- Never left unit – meals & recreation occur on unit
MDR-TB in Federal Pretrial Facility

- 388 inmate contacts identified
  - Prior Positive TST: 155/384 = 40%
  - Inmate TST conversions: 29 /158 (18%)
    - 17/69 (25%) Housed in same Quarter
- Staff TST conversions: 4/87 (4.6%)
- One clinical case of lymphatic TB – HIV infected inmate.
Federal Bureau of Prisons  Federal Pretrial Facility
MDR-TB Contact Investigation: Dispersal of 388 Inmate Contacts

Dispersal of Inmate Contacts
(n=388)
as of 12/11/10

- **Deported**: n=102 (foreign communities, 98→Mexico)
- **Other FBOP Facilities**: n=101 (43 facilities)
- **Remained incarcerated at FPF**: n=84
- **Released - California community**: n=38
- **USMS “In-Transit”**: n=63 (5 contract facilities)

Location of Inmate Contacts:
- Other FBOP facility
- USMS contract facility
- California community
- Foreign community
Take Home Messages

• **Diagnostic delay** contributed to this outbreak

• Factors contributing the diagnostic delay:
  • Radiologic interpretation (not mentioning TB in the differential diagnosis)
  • Lack of TB experience on the part of the prison medical staff

  “Correctional facilities are high incidence settings often located in low incidence areas for TB”
Treating Inmates with TB: Lessons Learned

• When you send an inmate “home,” they are not going to an apartment...they are going to a place with over 100 “housemates”

• Fluoroquinolones treat TB...recommend using an alternative drug class with suspected CAP in an inmate

• Infiltrates/cavities in an inmate is presumed TB until proven otherwise

• BAL AFB negative smear DOES NOT rule out TB. Obtain a sputum after a BAL.
Treating Inmates with TB, continued

• Criteria for release to general population includes:
  • ALTERNATIVE DIAGNOSIS clearly established that explains the pulmonary abnormality, OR
  • 3 negative sputum smears for AFB, obtained 8 hours apart, OR
  • RIPE treatment (14 days if initially AFB smear positive, 7 days if smear negative)
  • AND evidence of clinical improvement
Questions & Discussion