Epidemiologic Notes and Reports

Tuberculosis Outbreak Among Persons in a Residential Facility for HIV-Infected Persons -- San Francisco

From December 19, 1990, through April 4, 1991, 12 cases of clinically active pulmonary tuberculosis (TB) were diagnosed at a residential facility for HIV-infected persons in San Francisco. This report summarizes results of the outbreak investigation.

On December 19, 1990, a resident who had lived in the facility since November was hospitalized with a history of several weeks of productive cough, fever, and night sweats. He was subsequently diagnosed with sputum-smear-positive and culture-positive pulmonary TB, with organisms susceptible to all anti-TB drugs. He received anti-TB medication and did not return to the residential facility.

On January 19, 1991, another resident was admitted to a local hospital with a history of 7 days of productive cough, fever, chills, and shortness of breath. Sputum induction was performed to rule out Pneumocystis carinii pneumonia, and a specimen of induced sputum was smear-positive for acid-fast bacilli (AFB). The patient began anti-TB therapy on January 21. Mycobacterium tuberculosis subsequently grew from his sputum, blood, and pleural fluid. He was discharged back to the facility February 5 but did not take medication as recommended. He was readmitted to the hospital February 15, and his sputum was again smear-positive for AFB. Despite the administration of anti-TB therapy and mechanical ventilation, he died March 10 of respiratory failure and sepsis caused by Pseudomonas aeruginosa.

From February 21 through March 4, four additional residents of this facility who had symptoms of pulmonary TB were admitted to hospitals (Figure 1); two had sputum specimens that were smear- and culture-positive for M. tuberculosis. A sputum specimen from a third patient was smear-negative for AFB, but a culture of bronchoalveolar lavage was positive for M. tuberculosis. A sputum specimen from a fourth patient was smear- and culture-negative, but the patient had a documented tuberculin skin-test conversion and an abnormal chest radiograph; both radiographic and clinical improvement were observed on anti-TB therapy.

On March 6, the Tuberculosis Control Division, City and County of San Francisco Department of Public Health, conducted tuberculin skin-test screening of all 17 persons who resided in the facility on that date and 14 of 20 staff members; seven persons who had resided in the facility after November 1990, as well as six staff members, were unavailable during the initial screening. Seven (41%) of the residents had positive tuberculin reactions (greater than or equal to 5 mm); one (6%) had a negative tuberculin reaction (0 mm) with positive reactions to companion delayed-type hypersensitivity (DTH) skin-test antigens (mumps and Candida); and nine (53%) were anergic. Four (29%) of the staff had positive tuberculin reactions (greater than or equal to 5 mm); one had previously had a negative tuberculin reaction. Staff were not tested with
Chest radiographic examinations were performed on all residents, regardless of skin-test status. Three (43%) of the seven residents with positive tuberculin tests had clinically active pulmonary TB. All three had negative sputum-smears for AFB; two had positive cultures for M. tuberculosis. The third patient, who had an abnormal chest radiograph consistent with TB, improved clinically and radiographically on anti-TB therapy; culture results from this patient are pending. In addition, two (22%) of the nine anergic patients had clinically active pulmonary TB; both had sputum specimens that were smear- and culture-positive. All positive M. tuberculosis isolates were susceptible to all anti-TB drugs.

Of the remaining 12 residents without evidence of clinically active TB, 11 were offered isoniazid (INH) preventive therapy for TB; 10 accepted. One patient was not treated preventively because of abnormal liver function. This patient was anergic during the screening on March 6 but had had a normal chest radiograph. However, on April 1, the patient developed fever, chills, and a nonproductive cough. A chest radiograph on April 3 showed an infiltrate and left hilar adenopathy. An induced sputum test was smear-positive for AFB; results of sputum cultures are pending.

Chest radiographs for the four staff members who had positive skin tests showed no clinically active disease. All accepted INH preventive therapy.

The two-and-one-half-story facility has 32 private rooms, several shared bathrooms, two group meeting rooms, and a shared kitchen. Each room has a forced-air heating vent with no recirculation of air. Eight of the 12 case-patients lived on the second floor (which has 15 rooms); the remaining four case-patients lived on the first floor (11 rooms). No cases were identified in the six rooms of the half story. All case-patients were ambulatory.

Three of the 12 patients died; TB was considered a contributory cause of two deaths. Reported by: CL Daley, MD, GF Schecter, MD, Tuberculosis Control Div, City and County of San Francisco Dept of Public Health; GW Rutherford, MD, State Epidemiologist, California Dept of Health Svcs. Div of Tuberculosis Elimination, National Center for Prevention Svcs, CDC.

**Editorial Note**

Editorial Note: This outbreak demonstrates the rapidity with which TB can spread among immunocompromised persons in a communal setting. Time from diagnosis of first case to last was 106 days. Although no information on previous skin-test status was available for the residents, the temporal and spatial clustering of these cases strongly suggests transmission of TB within the facility. A previous study emphasized the high risk for developing clinically active TB among HIV-infected persons with latent remote tuberculous infection (1); the current report and others demonstrate that HIV-infected persons recently infected with M. tuberculosis are at high risk for progressing rapidly to clinically active disease (2,3).

This outbreak further demonstrates the urgency of immediate identification and medical evaluation of all HIV-infected contacts of persons with documented or suspected infectious TB (4). The rapid progression from tuberculous infection to clinically active disease in HIV-infected persons makes early investigation of contacts especially critical.

In addition, this and other outbreaks (5) indicate the importance of TB screening for all persons who are HIV-infected or at high risk for HIV infection before they enter communal living facilities. Persons with infectious TB, especially HIV-infected persons, should be admitted to communal settings only when they...
are considered noninfectious (i.e., clinically responding to therapy and sputum smear-negative for AFB) (6).

Companion DTH skin-testing during this contact investigation identified two of nine anergic patients with clinically active disease. Companion DTH skin-testing should be performed on persons with or at high risk for HIV infection. HIV-infected persons who are anergic and known contacts of infectious TB patients or otherwise at high risk for TB infection (e.g., injectable-drug users or those born in a country with endemic TB) should receive chest radiographs and clinical assessment to rule out clinical TB and, if negative, preventive therapy with 1 year of INH should be considered (7).

Health-care workers and others caring for HIV-infected or high-risk persons should be familiar with the symptoms of TB and be alert for TB among these patients. Persons suspected of having TB should be evaluated medically and immediately transferred to appropriate isolation settings. All HIV-infected patients with symptoms compatible with TB should receive chest radiographs and other diagnostic evaluations, regardless of the results of tuberculin and companion antigen skin-tests.

References


6. CDC. Guidelines for preventing the transmission of tuberculosis in health-care settings, with special focus on HIV-related issues. MMWR 1990;39(no. RR-17).


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