State of Alaska Epidemiology Bulletin

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HIV Infection, Tuberculosis (TB), and Anergy Testing

In many areas of the United States, HIV/TB coinfection has become increasingly common. During the first 7 months of 1992, two HIV-infected Alaska residents were diagnosed as having TB disease. Until this year, only four individuals with both AIDS and TB disease had been reported in Alaska. Diagnosing TB disease or TB infection in HIV-infected persons can be challenging, since many are anergic.

Anergy is the inability to mount a delayed-type hypersensitivity (DTH) response to a battery of common skin test antigens, indicating suppression of cell-mediated immunity. The meaning of a "negative" PPD skin test reaction in an anergic individual is unclear; it may represent either a true negative result or a false negative response. Diseases or conditions associated with anergy are numerous (Table 1). More than 10% of HIV/TB-coinfected persons may have a negative tuberculin skin test as a result of anergy.

Anergy testing should be considered for immunosuppressed persons--particularly those with HIV infection--whose PPD skin test reaction is unknown or is negative. **Identifying HIV/TB-coinfected persons or anergic, HIV-infected persons who are likely to be TB-infected is important, since (1) the presence of HIV infection necessitates lengthening of the course of treatment of TB infection or disease, and (2) failure to provide appropriate preventive or curative anti-TB therapy to persons with HIV/TB coinfection may be disastrous**.

The Centers for Disease Control recommends anergy testing by the Mantoux method (intradermal injection of 0.1 ml of antigen into the volar surface of the forearm) with at least two DTH skin test antigens, in addition to PPD. The most commonly used antigens are mumps antigen, tetanus toxoid, and Candida antigen. Multiple-puncture anergy panels are available commercially (e.g., Connaught's Multitest-CMI®), but they are expensive and do not inject intradermally a predictable quantity of each antigen.

In mid-September, anergy testing (by the Mantoux method only) will be available to patients referred to the Municipality of Anchorage Health Department's TB Clinic. This may later be expanded to a limited number of other urban Public Health Centers. Because of their cost, the Section of Epidemiology cannot supply anergy-testing materials to other health-care providers.

The recommended duration of isoniazid (INH) preventive therapy for HIV-infected persons with TB infection (i.e., persons with a significant PPD induration reaction but no clinical or radiographic signs of disease caused by M. tuberculosis) is a minimum of 12 months, although some experts have suggested prolongation of therapy beyond 12 months.

Treatment of HIV-infected persons with TB disease (i.e., persons with clinical or radiographic signs of active disease caused by M. tuberculosis) should consist of INH, rifampin (RIF), and pyrazinamide (with ethambutol for patients with CNS or disseminated disease or when INH resistance is suspected) for 2 months, followed by INH and RIF for an additional 7 months (and for at least 6 months beyond documented culture conversion as evidenced by three negative cultures); disease due to organisms resistant to INH or RIF requires longer therapy with other antimycobacterial agents.

Recommendations:

1. All patients diagnosed with TB disease should be offered counseling and HIV-antibody testing.

2. Persons with TB infection should be questioned about risk factors for HIV infection; those who are at risk should be offered counseling and HIV-antibody testing.

3. HIV-infected persons should be PPD-skin-tested for evidence of TB infection; those with a negative reaction (<5mm induration)='" should='" be='" tested='" for='" anergy.='" alternatively,='" the='" ppd='" skin='" test='" can='" be='" done='" as='" part='" of='" an='" initial='" anergy='">

4. Preventive therapy should be considered for anergic, HIV-infected individuals who are known contacts of infectious TB patients and for those from groups in which the prevalence of TB infection is ≥10% (e.g., intravenous-drug users, prisoners, homeless persons, migrant laborers, and persons born in countries in Asia, Africa, and Latin America with high rates of TB). All such persons should be carefully evaluated for active TB (with a chest x-ray and clinical assessment) before beginning preventive therapy.

Table 1. MAJOR CAUSES OF ANERGY

- Viral infections (HIV, measles, mumps, chickenpox)
- Bacterial infections (typhoid, pertussis, brucellosis, leprosy, overwhelming TB)
- Live-virus vaccinations (measles, mumps, rubella, polio, yellow fever) during previous 4-6 weeks
- Chronic renal failure
- Malnutrition
- Drugs (corticosteroids and other immunosuppressive agents)

  Diseases affecting lymphoid organs (lymphomas, lymphocytic leukemia, sarcoidosis)
- Age (newborn or elderly patients)
- Stress (surgery, burns, mental illness)

(Contributed by Michael Jones, MD)