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Hepatitis B - Recent Advances Tuberculosis – Treatment and Prevention

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TUBERCULOSIS IN CHILDREN

Educational Objectives

1. To learn proper management of positive PPD with a negative chest x-ray;
2. Discuss logical work-up in children whom suspected to have pulmonary TB;
3. To know current drug treatment of Tuberculosis;
4. To discuss transmission, isolation.

Microbacterium tuberculosis is the only microbactrium transfer from person to person. World wide, there are 8 million new cases each year and each year, there are 2 million death from Tuberculosis (TB). In Northern America, most cases of TB involving foreign-born persons who originally came from high TB prevalence countries, such as Mexico, Philippines, Vietnam, China, Korea, Haiti, Russia et. Among those populations, the disease usually arises from reactivation of a latent infection that was acquired prior to migration to the United States.

PREVENTION OF TUBERCULOSIS (TB)

A. Primary Prevention

1. Finding new cases by target testing (formerly called PPD screening)
2. Treatment of latent infection due to Mycobacterium tuberculosis (formerly termed "preventive therapy for TB"). Persons with latent tuberculosis infection are at high risk of reactivation.

B. Secondary Prevention: Vaccination (BCG)

CURRENT RECOMMENDATIONS OF TARGETED TESTING

A. Annual PPD (Mantoux skin test.) testing of children in high risk groups.

B. PPD to be read by specially trained health care staff.

C. Multiple puncture skin tests are not recommended.

D. Criteria in PPD interpretation:
1. 3 5 mm positive for
    a. recent contact with sputum positive infectious TB case
    b. known or suspected HIV infection
    c. chest x-ray consisted with TB
2. 3 10 mm positive for all others
3. Interpretation in patient who had BCG: in general, disregard BCG history; PPD is not contraindicated in person with previous BCG
4. PPD conversion:
    a. increase in reaction by 3 10 mm within 2 years
    b. implies recent infection
    c. consider boosting effect (usually seen in adult), performing two steps test
5. a negative PPD skin test dose not rule out TB. Family investigation is indicated whenever a PPD skin test result from a child converts from negative to positive (indicating recent infection).

BCG VACCINE

BCG is a live attenuated vaccine derived from a culture of a virulent strain of Mycobacterium bovis. Due to many strains and batches of BCG which are produced by different methods and contained different, immunogenicity, the efficacy of BCG varied from 0% to 80%. In general, we do not use BCG in the U.S. because
1. the efficacy is not clear
2. interfere with the interpretation of PPD skin test
3. interfere with surveillance
4. contraindicated in patients with HIV or other immunodeficiancy disorders.

TREATMENT OF LATENT TUBERCULOUS INFECTION

1. Isoniazid (INH) 10 mg/kg/day x 9 months (maximal 300 mg/day)
2. If INH resistant: Rifampin (RIF) 10 mg/kg/day x 6 months (maximal 600 mg/day; 450 mg/day if-weight less than 50 kg)
3. For both INH and RIF resistant : Ethambutol plus Quinolone) x 12 months
4. Persons with positive PPD and fibrotic lesion on chest x-ray, negative sputum: INH x 12 months or INH + RIF x 4 months

WHO SHOULD RECEIVE INH PROPHYLAXIS

1. Children with positive PPD, negative chest x-ray
2. All household or close contacts of a sputum positive infectious case.
3. PPD positive, chest x-ray negative person who has risk factor for progression

4. Foreign–born person from high prevalence countries entered the U.S. 5 years or less with a positive PPD

(2, 3, 4,--- regardless of age)

MONITORING

Except for HIV patients, pregnant women, immediate post parturn women, excessive alcohol users, patients with chronic liver disease et, no need for base line LFT of follow-up LFT (CDC). Monthly clinical monitoring is required; prescription for one month supply only. Base line LFT and uric acid and subsequent Lab monitoring are required if Pyrazinamide (PZA) is used.

PYRIDOXIN (B6): Pyridoxin should be given for 1) patients with risk factors for developing peripheral neuropathy 2) pregnant women and patients with a history of seizure disorder

TREATMENT FOR TUBERCULOSIS

Total 9 months treatment is recommended for pediatric patients (INK RIF sensitive); total 12 months treatment is recommended for extrapulmonary TB such as TB meningitis, bone/joint TB (if INH and RIF are sensitive)

Initial phase (first two months): 4 drugs regimen

1. Isoniazid (INH) 10 to 20 mg/kg/day (maximal 300 mg/day)
2. Rifampin (RIF) 10 to 20 mg/kg/day (maximal 600 mg/day; 450 mg/day for less than 50 kg)
3. Pyrazinamide (PZA) 25 mg/kg/day (two months only)
4. Ethambutol (EMB) 15 mg/kg/day (safe and well tolerate in children)

Continuous phase (last 7 months)

1. After two months of treatment, drug susceptibility results should be available
2. If fully susceptible: INH +RIF ; total 12 months for extra pulmonary TB
3. If INH resistant: RIF + EMB (total 12 months); ID consultation
4. If RIF resistant or not tolerated: INH + EMB ; ID consultation
5. If susceptibility is not available: treatment depends upon local incidence of drugs resistance
6. Alternative treatment schedule for pediatric patients: 2 times/wk; 3 times/wk

HEPATITIS B IN CHILDREN

Educational Objectives

1. To review routs of transmission and consequence or infection;
2. To learn how to interpret serological results;
3. To know post exposure prophylactic treatment;

4. To discuss hepatitis B vaccine

Hepatitis B virus (HBV) infects more than 350 million people worldwide. HBV is a leading cause of chronic hepatitis, cirrhosis and hepatocellular carcinoma.

Epidemiology: Prevalence is high in South East Asia, China and Africa. In those endemic areas, more than half of the population is infected at some time in their lives and more than 8% are chronic carriers of HBV. The prevalence of HBV carrier rate in the United States is in 0.1% to 0.9% of the general population. Within the general population, carrier rate is 5-10 times higher in Asian Americans, multiple transfused individuals, IV drug abusers, homosexual men and patients with HIV infection.

The natural history of HBV infection in Asians and Western patients: Asian patients and patients in other endemic areas become infected early in life. HBV infection usually secondary to maternal-neonatal transmission and horizontal spread between very young children. Those patients rarely have clinical hepatitis but almost invariably remain chronically infected (90% to 95% in maternal-neonatal transmission and 30% to 50% in horizontal transmission).

Western patients usually infected as adults by percutaneous or sexual exposure, transfusions, hemodyalysis etc. Those patients rarely became chronically infected (less than 10%). An intact immune system is vital to viral clearance.

Prevention Of HBV Infections: 1) Universal vaccination of all NB infants (0, 1, 6 month); Thimerosal free HB vaccine is available (Recombivax HB) 2) HBV vaccine for all adolescents age 11-15 years. In October of 1999, the Advisory Committee on Immunization Practice approved the optional two doses schedule (l ml at 0, 4-6 months).

Treatment of Chronic Hepatitis B: 1) Interferon alpha (IFN) 2) Lamivudine (an oral nucleoside analogues). Both antiviral agents efficaciously associated with histological, biochemical and serological improvement. Lamivudine has less side effect and convenience of administration. The effect of Lamivudine is similar in Asians and Western patients. Interferon treatment of Chinese adults with chronic hepatitis B was considerable less effective. The data of treatment in pediatric patients are very limited at this time.