

HAEMOPHILUS INFLUENZAE CASE 'QUICKSHEET'

California Department of Public Health – July 2005

Infectious agent: *Haemophilus influenzae* (a bacterium). H.i. can be isolated in encapsulated and unencapsulated forms. There are six capsular forms (types a-f). Virtually all isolates from cerebrospinal fluid and blood, during the pre-vaccine era, were the capsular type b (Hib). The polysaccharide capsule is of major significance because it is an important virulence factor. Unencapsulated strains of H.i. can cause disease and are generally referred to as nontypeable.

Mode of transmission: H.i. is transmitted person-to-person by respiratory droplet or direct contact with nasopharyngeal secretions of an infected person. The most common portal of entry is the nasopharynx. Newborns can become infected by inhaling amniotic fluid or genital tract secretions containing the organism.

Incubation period: The incubation period is unknown but probably short, 2-4 days.

Period of communicability: Persons with H.i. are infectious as long as organisms are present in the upper respiratory tract, which may be for a prolonged period even without nasal discharge. With appropriate antibiotics, communicability ends within 24-48 hours after starting treatment.

Communicability: The contagious potential of invasive H.i. disease is considered to be limited. However, certain circumstances, particularly close contact with a case (e.g., in a household, daycare center, or institutional setting), can lead to outbreaks of Hib or secondary transmission of the disease. Asymptomatic carriage is known to occur.

CDC CASE DEFINITION AND CLASSIFICATION (for purposes of public health reporting)

Clinical case definition: Invasive disease caused by *Haemophilus influenzae* may produce any of several clinical syndromes, including meningitis, bacteremia, epiglottitis, or pneumonia.

Laboratory Criteria for Diagnosis: Isolation of *H. influenzae* from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid).

Case Classification: (Only probable and confirmed cases < 30 years of age should be reported to DHS)

Probable: A clinically compatible case with the detection of *H. influenzae* type b antigen in CSF.

Confirmed: A clinically compatible case that is laboratory confirmed.

CLINICAL FEATURES

- Invasive disease caused by H.i. can produce any one of several clinical syndromes, including, meningitis, epiglottitis, pneumonia, arthritis and cellulitis. Osteomyelitis and pericarditis are less common.
- Otitis media and acute bronchitis due to *H. influenzae* are generally caused by nontypeable strains.
- Hib strains account for only 5-10% of *H. influenzae* causing otitis media.

EPIDEMIOLOGY

- Currently, invasive Hib disease occurs primarily in underimmunized children and among infants too young to have completed the primary vaccination series. Hib disease is unusual in healthy individuals >5 years of age.
- In the U.S., peak incidence of invasive H.i is in infants < 6 months of age.

LABORATORY TESTING

Culture: Confirming a case of Hib requires culturing and isolating the bacterium from a normally sterile body site (e.g., cerebrospinal fluid (CSF), blood, joint fluid, pleural effusion, pericardial effusion, peritoneal fluid, placenta and amniotic fluid). All H.i. isolates associated with an invasive infection in children < 5 years of age (and if possible isolates from cases 5-14 years of age) should be serotyped in order to identify the strain and to differentiate between serotype b and other serotypes for which control measures are not required.

Antigen detection: Antigen detection may be used as an adjunct to culture, particularly in the diagnosis of patients who have been partially treated with antimicrobials and the organism may not be viable on culture. Latex agglutination is a rapid, sensitive and specific method to detect Hib capsular polysaccharide in CSF, but a negative test does not exclude the diagnosis and false positive tests have been reported.

RECOMMENDED CASE MANAGEMENT

Treatment: Initial treatment for children with meningitis possibly caused by Hib is cefotaxime sodium or ceftriaxone sodium or ampicillin in combination with chloramphenicol. Ampicillin alone should not be used because of frequent resistance. For antimicrobial treatment of other invasive H.i. infections, including those caused by strains other than type b, recommendations are similar but based on empiric experience (see AAP Red Book).

Isolation: In patients with invasive Hib disease, droplet precautions are recommended for 24 hours after initiation of anti-microbial therapy.

DISEASE REPORTING AND CASE INVESTIGATION

The purpose of surveillance and reporting is to monitor the disease burden of Hib and the long-term vaccine effectiveness of Hib vaccine.

1. Confirm report that suspected case(s) meets case definition and/or is highly suspected.
2. Collect lab specimen(s) for diagnosis from case and ensure that typing of the H.i. isolate is being done. Forward H.i. isolates associated with invasive disease in cases < 5 years (and if possible isolates from cases 5-14 years of age) to the DHS Microbial Diseases Lab.
3. Start antibiotic treatment of case.
4. Identify and notify close contacts of Hib cases.
5. When indicated, prophylaxis should be initiated as soon as possible, given that most secondary cases in households occur during the first week after hospitalization of the index case. It may sometimes be necessary to consider prophylaxis for at-risk contacts of a person with invasive H.i. when the serotype is unknown.
6. Vaccinate children who are not up-to-date for Hib.
7. Active surveillance of contacts of Hib cases. Careful observation of exposed immunized or incompletely immunized household, child care or nursery contacts is essential. Exposed children in whom a febrile illness occurs should receive prompt medical evaluation.
8. Report both confirmed and probable H.i. cases < 30 years of age to DHS.

CHEMOPROPHYLAXIS FOR CONTACTS OF CASES OF INVASIVE HIB DISEASE

Rifampin eradicates Hib from the pharynx in approximately 95% of carriers. Limited data indicate that rifampin prophylaxis also decreases the risk of secondary invasive disease in exposed household contacts.

Note: Treatment of Hib disease with cefotaxime sodium or ceftriaxone sodium generally eradicates Hib colonization, eliminating the need for prophylaxis of the index patient.

Indications and guidelines for chemoprophylaxis in different circumstances are described in the AAP Red Book and summarized in the table below.

Indications for Rifampin chemoprophylaxis for contacts¹ of index cases of invasive Hib disease
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| <ul style="list-style-type: none">• All household contacts in the following circumstances:<ul style="list-style-type: none">• Household with a child < 4 years of age who is not vaccinated or is incompletely vaccinated².• Household with an immunocompromised child, regardless of that child's Hib vaccination status• Nursery school and childcare center contacts, regardless of age, when ≥ 2 cases of Hib invasive disease have occurred within 60 days. |
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¹ Defined as people residing with the index patient or nonresidents who spent 4 or more hours with the index case for at least 5 of the 7 days preceding the day of hospital admission of the index case.

² Complete vaccination is defined as having had at least one dose of conjugate vaccine at 15 months of age or older; 2 doses between 12 and 14 months of age; or a 2- or 3- dose primary series when younger than 12 months with a booster dose at 12 months or older.