Public Health Investigation Quicksheet: Invasive Haemophilus influenzae

Infectious Agent

Haemophilus influenzae (H. flu), a bacterium, can be isolated in six encapsulated forms (types a-f) and also in unencapsulated forms. The polysaccharide capsule is an important virulence factor; unencapsulated or "nontypable" strains typically do not cause invasive disease. Pharyngeal colonization with H. flu is relatively common, especially with unencapsulated strains and non-b capsular strains.

Young children do not have the ability to make antibodies to polysaccharide and are more susceptible to infection with encapsulated bacteria. This is especially true for children between six months and one year of age who no longer have maternal antibody protection. People with functional or anatomic asplenia and other conditions are also at higher risk of infection with encapsulated bacteria.

Mode of Transmission

Person-to-person by inhalation of respiratory aerosols or by direct contact with respiratory tract secretions.

Communicability

The contagious potential is considered to be limited. However, close contact with a case (e.g. in a household, daycare, or institutional setting) can lead to an outbreak or secondary transmission of the disease.

Incubation Period

The incubation period is unknown.

Case Investigation

Start the case investigation as soon as possible regardless if the serotype is not yet known. This allows us for broader prophylaxis and intervention planning while laboratory testing is being completed should the serotype come back as H. flu, type b “Hib”.

1. Review clinical records (admission history & physical, progress notes) to confirm that the suspected case meets the NNDSS case definition clinical criteria for H. flu invasive disease.
2. Confirm that laboratory tests performed meet the criteria for diagnosis confirmation.
   a. Detection/Isolation of H. flu from a normally sterile body site (e.g. CSF, blood, joint fluid, pleural fluid, pericardial fluid).
   b. Ensure that isolate or nucleic acid sample is forwarded to the Arctic Investigations Program for confirmation and serotype testing.
3. Ensure that patient is receiving appropriate antibiotic treatment.
   a. Exclude from day care, school, or work until 24 hours after appropriate antibiotic therapy.
4. Complete the H. flu Invasive Disease Case Questionnaire to identify household contacts and/or other individuals at high-risk for serious disease.
   a. Ensure that appropriate chemoprophylaxis is initiated as soon as possible for cases of invasive disease caused by Hib. Because some secondary cases may occur late, initiation of prophylaxis >7 days after hospitalization of the index patient may still be of some benefit. See the following Guidelines for Chemoprophylaxis section.

b. Perform active surveillance to monitor exposed unimmunized or incompletely immunized contacts for evidence of disease. Individuals who develop febrile illness should receive prompt medical evaluation.
5. Fax the completed Case Questionnaire to AK-SOE at 907-563-7868.

Patient Treatment

Initial therapy for children with H. flu meningitis is cefotaxime or ceftriaxone. Ampicillin can be substituted if the Hib isolate is susceptible to ampicillin. Treatment of other invasive H influenzae infections is similar. Therapy is continued for 7-10 days by the intravenous route and longer in complicated infections.

Treatment of Hib disease with cefotaxime or ceftriaxone eradicates Hib colonization, eliminating the need for prophylaxis of the index patient. Patients who do not receive at least 1 dose of cefotaxime or ceftriaxone and who are younger than 2 years should receive rifampin prophylaxis at the end of therapy for invasive infection.

Isolation of patients with invasive Hib disease

Droplet precautions are recommended for 24 hours after the initiation of appropriate parenteral antimicrobial therapy.

Guidelines for Chemoprophylaxis for Contacts of Index Case

Chemoprophylaxis is only recommended around cases of invasive Hib disease; not recommended if isolate serotype is nontypable or non-b.

Chemoprophylaxis Recommended

- For all household contacts in the following circumstances:
  - Household with at least 1 contact younger than 4 years of age who is unimunized or incompletely immunized
  - Household with a child younger than 12 months of age who has not completed the primary 3-dose Hib series
  - Household with a contact who is an immunocompromised child, regardless of that child's Hib immunization status or age
  - For preschool and child care center contacts when 2 or more cases of Hib invasive disease have occurred within 60 days (see text)

For prophylaxis, rifampin should be given orally:

<table>
<thead>
<tr>
<th>Persons &gt; 1 month of age</th>
<th>Infants younger than 1 month of age</th>
</tr>
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<tbody>
<tr>
<td>Once a day for 4 days (20 mg/kg; maximum dose 600mg)</td>
<td>Once a day for 4 days (10 mg/kg)</td>
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Chemoprophylaxis Not Recommended

- For pregnant women

a. Defined as people who spent 4 or more hours with the index patient for at least 5 of the 7 days preceding the day of hospital admission of the index case.

Reporting

Enter case investigation information into the AK-STARS surveillance database. Refer to disease-specific data entry guidelines. Complete FTR report when warranted by circumstances.

Resources

Case Investigation and Classification Flowchart (Appendix A)
AK-SOE H. influenzae webpage
2015 AAP Red Book

Section of Epidemiology Infectious Disease Program | Phone 907-269-8000 | Fax 907-563-7868 | http://dhss.alaska.gov/dph/Epi/id/Pages/default.aspx
Invasive *Haemophilus influenzae*
Case Investigation and Classification Flowchart

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Haemophilus influenzae invasive disease
report to AK-SOE by HCP or laboratory,
Enter into AK-STARS

Not a case. Continue to investigate. Complete
interstate reciprocal notification of disease form for referral to
case’s residential state.

Alaska Resident?

Yes

Meets clinical case definition: invasive disease may manifest as
pneumonia, bacteremia, meningitis, epiglottitis, septic arthritis, cellulitis,
or purulent pericarditis; less common infections include endocarditis and
osteomyelitis

No

Collect sample(s) from normally sterile
site (CSF, blood, joint fluid, pleural fluid,
pericardial fluid) for culture and/or H.
influenza-specific PCR. Send to
laboratory for testing.

H. flu isolated by culture
or detected by PCR?

No

Not a case

Yes

All of the following steps
must be done. Do not wait to
complete one before starting
the others.

1. Submit isolate(s) to
CDC-AIP for
confirmation and
serotype testing.

2. Assess patient and
household contact
immunization status

Are any persons < 4
years of age?

Yes

Has the person(s) completed a
series of 3 or more doses of Hib
vaccine?

No

Give a dose of Hib vaccine and
complete the series per the age
appropriate immunization schedule.

No

Hib?

Yes

Confirmed

Monitor contacts for evidence of
disease for 7 days

Evidence of disease?

Yes

Refer to HCP for further
evaluation

No

Provide prophylaxis to
household, preschool, and
childcare center following AAP
Red Book recommendations

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Date: 08/24/17