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1.0 GOAL

To eliminate vaccine preventable cases of invasive *Haemophilus influenzae* type b (Hib) disease in children under 5 years of age by:

- 1) delivery of routine on-time immunization to children at ages 2, 4, 6 and 18 months
- 2) immunization of previously unimmunized children under 5 years of age
- 3) immunization of high risk individuals aged older than 5 years
- 4) case management and contact follow-up with chemoprophylaxis if indicated
- 5) reporting of cases of invasive Hib disease

2.0 CLINICAL DESCRIPTION

Haemophilus influenzae type b was the most common cause of bacterial meningitis and a leading cause of other serious invasive infections in young children before the introduction of Hib vaccines. About 55% to 65% of affected children had meningitis, the remainder suffering from epiglottitis, bacteremia, cellulitis, pneumonia, or septic arthritis. The case fatality rate for meningitis is about 5%. Severe neurologic sequelae occur in 10% to 15% of survivors and deafness in 15% to 20% (severe 3% to 7%).

The risk of Hib meningitis is at least twice as high for children attending full-time day care as for children cared for at home. Other factors that predispose to invasive disease include sickle cell disease, asplenia, HIV infection, certain immunodeficiency syndromes, and malignant neoplasm.

The onset can be subacute but is usually sudden, with fever, vomiting, lethargy, and meningeal irritation; bulging fontanelle in infants; or stiff neck and back in older children. Progressive stupor or coma is common.

H. influenzae is also commonly associated with otitis media, sinusitis, bronchitis, and other respiratory tract disorders. However, since type b organisms seldom cause these disorders, Hib vaccines have not affected their incidence.

Incubation period - unknown; probably short (2 to 4 days).

Period of communicability – as long as organisms are present, which may be for a prolonged period even without nasal discharge. Communicability ends within 24-48 hours after starting effective antibiotic therapy.



3.0 EPIDEMIOLOGY

Between 1995 and 2004, only 3 to 10 cases of invasive Hib disease were reported each year in BC. In 2004, five cases of invasive Hib disease were reported. Two cases were aged 5 and 6 years. The immunization status of the 5 year old was not reported. The 6 year old had been fully immunized with 4 doses of Hib-containing vaccine at the appropriate milestones. The other three cases were adults in their 40s.

4.0 CASE DEFINITION

Confirmed case:

Invasive disease (includes meningitis, bacteremia, epiglottitis, pneumonia, pericarditis, septic arthritis, or empyema) with laboratory confirmation of infection:

- Isolation of *H.influenzae* type b from a normally sterile site ♦

OR

- Isolation of *H. influenzae* type b from the epiglottis in a person with epiglottitis

OR

- Demonstration of *H.influenzae* type b antigen in cerebrospinal fluid

♦ Includes: blood, cerebrospinal, joint, pleural, pericardial, or peritoneal fluid

Probable case:

Buccal cellulitis or epiglottitis in a child < 5 years of age with no other causative organisms isolated.

5.0 REPORTING

Complete the individual case report screen in iPHIS (Public Health Information System) within 1 day of receiving the report. All cases of invasive *Haemophilus influenzae* are reportable in BC, including those due to non-b serotypes. Please be careful to report only serotype b cases as Disease = Haemophilus Infl. B based on the clinical entity: epiglottitis, meningitis, septicemia, septic arthritis, other invasive. Other serotypes should be reported as Disease = Haemophilus Infl. Typable: non-type B (invasive)", and the serotype should be selected from the drop-down menu in the "subtype" field.



6.0 CONTACT MANAGEMENT

Definition of a Contact of a case of invasive Hib disease:

A person residing with the case of invasive Hib disease **OR** a person who has spent 4 or more hours per day with the case for at least 5 of the 7 days preceding the day of hospital admission of the case. It is assumed that when children have spent 4 or more hours together per day, they are likely to have napped and/or eaten together, which increases transmission risk.

Identify contacts of the index case by name, date of birth or age, and Hib immunization status. Consult with the Medical Health Officer immediately to determine whether rifampin chemoprophylaxis and/or Hib immunization is necessary..

6.1 Immunoprophylaxis of Contacts

Post-exposure Hib immunization is not known to decrease the risk of transmission. Rather, the situation presents an opportunity for completion of Hib immunization of contacts.

Offer immunization to contacts less than 60 months of age who are unimmunized or not completely immunized for age and to individuals older than 5 years of age who have chronic conditions associated with increased risk of invasive Hib disease (e.g. sickle cell disease, asplenia, or immunodeficiency).

6.2 Chemoprophylaxis of Contacts

The aim of rifampin chemoprophylaxis is to eliminate nasopharyngeal carriage of Hib bacteria and prevent transmission. To effectively prevent secondary spread, rifampin should be given concurrently to all contacts (at the same time or within 3 days) to prevent reinfection within the contact group.

When indicated, chemoprophylaxis should be initiated as soon as possible. If more than 14 days have passed since the last contact with the index case, the benefit of rifampin prophylaxis is likely to be decreased. In previous studies that have looked at the risk of transmission in the 30 days following an index case in the household, 84% of secondary cases have occurred in the first 14 days after disease onset in the index case.



Prescriptions by the Medical Health Officer and/or attending physician are required for the dispensing of rifampin. While particular circumstances may warrant the Medical Health Officer being the physician who prescribes the rifampin, it is preferable that attending physicians prescribe it for their patients who meet the definition of a contact. Rifampin may be provided by the hospital pharmacist from inventory maintained for this purpose or as locally arranged by the Medical Health Officer.

Contacts of an index case should **not** be swabbed for culture of Hib prior to initiating rifampin chemoprophylaxis since the result has no bearing on the decision to administer rifampin.

Contacts developing symptoms of invasive Hib disease (particularly fever and headache) should seek prompt medical attention, even if rifampin has been taken.

Chemoprophylaxis is only recommended for cases of type b *Haemophilus influenzae*, not for other serotypes.

Chemoprophylaxis is recommended for:

(1) All household contacts, regardless of age, in the following circumstances:

- Household with at least 1 contact younger than 4 years of age who is unimmunized or incompletely immunized for age
- Household with a child younger than 12 months of age if the child has not received the primary series of three doses
- Household with an immunocompromised child regardless of that child's Hib immunization status (i.e., even if fully immunized).

(2) Preschool/day care contacts (including staff), regardless of age, when 2 or more cases of invasive Hib disease have occurred within 60 days among attendees and unimmunized or incompletely immunized children are attending.

(3) The case, if younger than 2 years of age or is a member of a household with a susceptible contact, and who had been treated with a regimen other than cefotaxime sodium or ceftriaxone sodium. Chemoprophylaxis usually is provided just before discharge from hospital



Chemoprophylaxis MAY be considered in the following situations at the discretion of the Medical Health Officer:

- All household contacts of the case when at least one contact is a child of any age with immunodeficiency, sickle cell disease, asplenia, or leukemia
- Health care workers who have administered mouth-to-mouth resuscitation to the case

If the index case attends preschool or day care, and the decision is to provide rifampin to all contacts, inform all parents of the situation. Together with the facility operator, plan and provide parent education about invasive Hib disease. It is especially important to discuss contraindications and side effects of rifampin. See Subsection [8.0 Rifampin Side Effects and Contraindications](#).

7.0 STORAGE AND DISTRIBUTION OF RIFAMPIN

Each Medical Health Officer shall establish a satisfactory means of storing and distributing rifampin for the purpose of Hib chemoprophylaxis. While the usual location is a designated hospital, other alternative locations may be required by local circumstances.

The supply of rifampin for Hib chemoprophylaxis shall be maintained separately from rifampin provided for anti-tuberculous therapy.

Regardless of the means adopted by the Medical Health Officer for storing and distributing rifampin for Hib prophylaxis, there must be no client charges for the service.

Health units may order rifampin using the BCCDC Vaccine and Pharmacy Services "Medication Order Form." Contact the Biologicals Desk at (604) 660 – 5692.

8.0 RIFAMPIN SIDE EFFECTS AND CONTRAINDICATIONS

Side effects of a short course of rifampin are rare, but may include sore mouth, nausea, diarrhea, headache, flu-like syndrome, and orange staining of the urine and tears. Those with contact lenses should be warned against wearing their lenses while taking rifampin to prevent permanent staining of the lenses.

Women on oral contraceptive pills (OCP) must be counselled to use additional contraceptive protection (e.g. condoms and foam) for the remainder of the cycle in which rifampin may temporarily interrupt effectiveness of oral contraceptives or the contraceptive patch.



Rifampin chemoprophylaxis against Hib should be avoided during pregnancy since the effects on the fetus are not known.

Rifampin chemoprophylaxis is **not** contraindicated during lactation, as only small amounts of rifampin are secreted into breast milk.

Contraindications to rifampin chemoprophylaxis include jaundice, hypersensitivity to rifamycins, prematurity, and receipt of ritonavir/saquinavir combination therapy. When rifampin is contraindicated, there is no alternative treatment. Inform these contacts about the signs and symptoms of invasive Hib disease, the infrequency of secondary cases, and advise them to access prompt medical attention should symptoms occur.

9.0 AUTHORITY

Health Act (1983) and Communicable Disease Regulation

10.0 REFERENCES

Advisory Committee on Epidemiology and the Division of Disease Surveillance, Bureau of Infectious Diseases, Laboratory Centre for Disease Control, Health Protection Branch, Health Canada. (2000). Case definitions for diseases under national surveillance. Canada Communicable Disease Report, Vol. 26S3.

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Heymann, D.L. (2004). Control of Communicable Diseases in Man. (18th ed.). Washington, D.C: American Public Health Association.

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11.0 RIFAMPIN: CLIENT INFORMATION FOR THE PREVENTION OF Hib INFECTION

WHY is this medicine prescribed?

Rifampin is an antibiotic prescribed to prevent the spread of *Haemophilus influenzae* type b (Hib) infection after contact with someone who is infected with it. Hib bacteria are spread by close contact with an infected person: living in the same household, sleeping together, or sharing saliva such as using the same eating utensils, drinking from the same container, or kissing.

HOW is this medicine taken?

To prevent Hib infection, 1 – 2 capsules of rifampin are usually taken by mouth once a day for 4 days. It is important that you finish taking all of the rifampin prescribed for you.

For infants and young children unable to swallow capsules, a Pharmacist can prepare the Rifampin dose as a liquid suspension.

WHO should NOT take this medicine?

- Premature infants
- Those who are allergic to it
- Those who have jaundice
- Those on ritonavir/saquinavir (combination antiretroviral therapy)

Women who are breastfeeding can take rifampin, as only small amounts are secreted into breast milk.

WHAT precautions should you be aware of before taking rifampin?

- If you are pregnant, consult your doctor before taking rifampin.
- Tell your public health nurse, pharmacist, or doctor if you are taking any other medicines.
- If you are taking warfarin, inform your doctor that you are taking rifampin because you will need to be more closely monitored
- Rifampin may cause oral contraceptives (i.e. birth control pills) and the contraceptive patch (EVRA®) to be less effective. You will need to use a second form of contraception (e.g. condoms) to prevent pregnancy.
- Rifampin may color urine and tears a red-orange color. This is harmless. However, since this may cause permanent staining of soft contact lenses, do NOT wear soft contact lenses until you have finished taking rifampin.
- Rifampin may cause drowsiness. Do not drive or operate dangerous machinery until you know how the drug affects you.

WHAT side effects can rifampin cause?

Side effects are uncommon when rifampin is taken for such a short time, but may include the following:

- Reddish-orange coloring of your urine, bowel movements, tears, or saliva. This is harmless.
- Stomach upset
- Headache

**** Tell your doctor immediately if you experience any of these after taking rifampin:**

- Skin rash, itching, or hives
- Difficulty breathing or swallowing
- Swelling of the face or throat
- Persistent upset stomach, vomiting, or diarrhea
- Fever or chills
- Sore mouth or throat
- Muscle or bone pain
- Yellowing of the skin or eyes