**Haemophilus influenzae** type b invasive disease (Hib)

**Epidemiology in New Zealand**

Historically, *Haemophilus influenzae* type b (Hib) was an important cause of serious illness in children under 5 years of age in New Zealand. However, following the addition of Hib vaccine to the national immunisation schedule in 1994, the age-specific rate of the disease reduced from 36.4 cases per 100,000 in 1993 to 1.7 cases per 100,000 by 1999 and has remained at low levels since then.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz

**Case definition**

**Clinical description**

Invasive disease due to Hib may manifest as bacteraemia, meningitis, epiglottitis, cellulitis, septic arthritis, pneumonia, empyema, pericarditis or osteomyelitis.

**Laboratory test for diagnosis**

**Laboratory confirmation requires** isolation of *H. influenzae* type b, or detection of *H. influenzae* type b nucleic acid, from a normally sterile site.

**Case classification**

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness with detection of a positive antigen test in cerebrospinal fluid, or a confident diagnosis of epiglottitis by direct vision, laryngoscope or X-ray.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.
Spread of infection

Incubation period
Unknown; probably 2–4 days.

Mode of transmission
By droplet inhalation of or direct contact with respiratory tract secretions.

Period of communicability
May be prolonged. Non-communicable within 24–48 hours after starting effective antimicrobial therapy.

Notification procedure
Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case

Investigation
Obtain a history of vaccination, possible contacts and travel.

Ascertaining if suspected or proven cases have occurred in the same household or early childhood service in the previous 60 days.

Ensure isolates from normally sterile sites are serotyped.

Restriction
Droplet precautions until 24 hours after the start of third-generation cephalosporin therapy (cefotaxime, ceftriaxone, ceftazidime) or until a 4-day course of rifampicin is completed.

Exclude case from any early childhood service or school and from close contact with previously unexposed people until 24 hours after commencing treatment.

Treatment
All cases should be under the care of a physician or paediatrician.

Cases treated with amoxycillin/clavulanate or amoxycillin alone should also receive oral rifampicin 20 mg/kg (maximum 600 mg) once daily for 4 days to eradicate carriage of the organism before discharge from hospital. Cases treated with a third-generation cephalosporin (cefotaxime, ceftriaxone, ceftazidime) do not need rifampicin.
Immunisation
Cases under 2 years of age should complete a course of Hib immunisation regardless of any previous Hib immunisation. The number of doses required will depend on the age at which the first dose is given after the illness. Re-immunisation should start 1 month after the onset of the disease.

Counselling
Advise the case’s parents or caregivers of the nature of the infection and its mode of transmission.

Management of contacts

Definition
Contacts for public health follow-up include members of the household, and staff and children at early childhood services – see below.

Duration of exposure of contacts to the case should be assessed on a case-by-case basis, but has been defined as spending four 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. (AAP Red Book 28th ed 2009).

Investigation
Nil. Routine throat or nasopharyngeal culture of contacts is not recommended.

Prophylaxis
To eradicate the carrier state and protect susceptible children, antimicrobial prophylaxis should be given to the following contacts as soon as possible and ideally within 7 days of the index case developing the disease, irrespective of their own immunisation status. Prophylaxis started after 7 days may still be of benefit and is recommended.

The relevant contacts are:
- all members of the case’s household (including adults) where there is at least one contact under the age of 4 years who is either unimmunised or partially immunised
- all members of a household where there is a child aged under 12 months, even if the child has had three doses (primary series) of the Hib vaccine
- all members of the case’s household where there is a person with immune suppression
- all staff and children at an early childhood service where two or more cases of Hib have occurred within 60 days.

Antimicrobial prophylaxis is not recommended for:
occupants of households where there are no children aged under 4 years other than the index case

occupants of households where all contacts aged under 4 years have completed their immunisation series, including the second-year-of life dose.

Use oral rifampicin 20 mg/kg (maximum 600 mg) daily for 4 days.

Rifampicin is contraindicated in pregnant women. Pregnant women who are a contact should be offered i.m. ceftrioxone (1 gram) daily for 4 days (Ladhani 2009).

**Restriction**

When chemoprophylaxis is required at an early childhood service (see above), children and staff should be excluded from the service until prophylaxis has been started.

Children entering the group while prophylaxis is being given should also receive it.

**Counselling**

Advise all contacts to seek early medical attention if symptoms develop. All children should have their immunisation status checked and, if it is incomplete, should complete their immunisation with an appropriate vaccine containing Hib.

**Other control measures**

**Disinfection**

Not applicable.

**Health education**

Stress the importance of full immunisation for all children.

Encourage early childhood services to keep up-to-date immunisation records of attending children.

**Epidemic control**

In a cluster or outbreak scenario, a larger group of individuals may need to be offered prophylaxis.

**Reporting**

Ensure complete case information is entered into EpiSurv.

If an outbreak occurs, inform the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.
References and further information

