

STUDY PROTOCOL Australian Paediatric Surveillance Unit Invasive Haemophilus Influenzae Infection

BACKGROUND

The introduction of *Haemophilus influenzae* type b (Hib) vaccine in Australia in 1993 has resulted in an 88% reduction invasive Hib disease in children under 5 years. However, cases which do occur are now more likely to be vaccine failure. Currently Australia seems to have more Hib disease than other countries with comparable Hib immunisation scheduled. This study will monitor the persistence of invasive Hib disease in Australia and document the isolates implicated. It is possible that the number of strains of *H.influenzae* other than type b will increase. The study will also determine the proportion of children with invasive Hib who are vaccine failures, estimate Hib vaccine efficacy and identify risk factors for vaccine failure. Collaboration has been established to enable the data to contribute to a European study of Hib vaccine failure, which is currently underway.

Invasive Hib disease is notifiable to local public health areas and APSU will act as an important additional source of information to provide a more accurate estimate of incidence and more details clinical and laboratory information. Please remember to notify all cases to your public health authority (state or local public health unit) as well as APSU.

Elsewhere, vaccine failure has been associated with prematurity and Down syndrome and may be a marker of immune deficiency. By making specialised laboratory techniques more readily available to all Australian paediatricians this study will also allow us to determine whether vaccine failures in Australia are associated with impaired immune response.

OBJECTIVES:

- 1. To provide an additional source of notification of cases of invasive *H. influenzae* disease in children.
- 2. To determine the proportion of cases in invasive Hib disease which are due to vaccine failure; identify risk factors for Hib vaccine failure; and determine whether *H. Inlfuenzae* isolates from cases which are due to vaccine failure differ from those which are not due to vaccine failure.

CASE DEFINITION

Any child aged less than 15 years with:

1. Isolation of H. influenzae (of any type or not typed) from any normally sterile site

or

- 2. Identification of Hib antigen in cerebrospinal fluid, blood or joint fluid in association with clinical features compatible with invasive Hib disease
 - or
- 3. A confident diagnosis of epiglottis (by direct vision or laryngoscopy) with supporting evidence of Hib infection (positive urinary Hib antigen or Hib isolated from epiglottis swab).

REPORTING INSTRUCTIONS

Please report any case fitting the definition immediately by phone to Dr P McIntyre on (02) 9845 0000 (page number 6549)

or to the laboratory (02) 9845 3418 or by fax (02) 9845 3421 and on the monthly APSU report card

If at all possible, please discuss individual cases directly with A/Prof David Isaacs or Dr Peter McIntyre on Tel: (02) 9845 3418 or fax: (02) 9845 3421 or Prof Don Roberton on Tel: (08) 8204 7452 or fax: (02) 8204 7031. Telephone notification will aid both clinical management and facilitate transport of specimens.

Any child who is unimmunised or inadequately immunised for age should be given further vaccine doses as needed to complete age-appropriate immunisation for Hib.

IF *H. INFLUENZAE* IS ISOLATED FROM A STERILE SITE:

Please ask your microbiology laboratory to contact one of the reference laboratories listed below to arrange transport of the *Haemophilus inlfuenzae* isolate for serotyping:

For cases from SA, Tasmania, VIC or WA:

Contact: Microbiological Diagnostic Unit (Dr Geoff Hogg or Ms Jenny David (03) 9344 5701)

For cases from ACT, NSW, NT or Queensland:

Contact: Centre of Infectious Diseases and Microbiology (Prof Lyn Gilbert or Ms Ansuya Sharma on (02) 9845 6255)

IF YOU SUSPECT HIB VACCINE FAILURE:

Hib vaccine failure definition

Any invasive Hib infection occurring at least one week following the second Hib immunisation given in the first year of life *or* at least one week after a single dose of Hib vaccine given after the age of 12 months.

Current recommendations for investigation and management of invasive Hib disease with suspected vaccine failure:

- 1. Collect serum for Hib antibody (PRP) as soon as possible after admission
- 2. Collect serum in convalescence (2 weeks or more after diagnosis) for Hib antibody, total immunoglobulins and IgG subclasses
- 3. If no significant increase in Hib antibody is found in convalescent serum, IgG subclass deficiency is much more likely. However, most children respond to a further dose of conjugate Hib vaccine even if IgG deficient and should be reimmunised.

Please ask your microbiology laboratory to contact one of the laboratories listed below to arrange transport of serum specimens for Hib antibody, IgG and IgG subclasses from children with suspected vaccine failure:

• To arrange transport for specimens from Queensland, NSW, ACT and Victoria, please contact either Dr McIntyre or A/Prof Isaacs or Mr Mark Hanlon at the Immunology Laboratory, New Children's Hospital Westmead (02) 9845 3418, lab (02) 9845 3320/3324 [Fax: (02) 9845 3421].

→ Forward specimens to the Immunology Laboratory, New Children's Hospital, Hawkesbury and Hainsworth Roads, Westmead NSW 2145 [Attention Mr Mark Hanlon (02) 9845 3320].

 To arrange transport for specimens from WA, SA, NT and Tasmania, please contact Prof Don Roberton at Women's and Children's Hospital Adelaide on (08) 8204 7452, lab (08) 8204 6328 [Fax: (08) 8204 7031].

→ Forward specimens to the Immunology laboratory, Adelaide Women's and Children's Hospital, North Adelaide 5006 [Attention Ms Leonie Dinan (08) 8204 6324]

FOLLOW-UP OF POSITIVE RETURNS

A questionnaire requesting further details will be forwarded to practitioners who report a case. At the time of diagnosis please record the Hib vaccination status of the child, including the date each vaccination was received, and, if available, the type of vaccine received. If possible, written records should be sighted. This information will be required to complete the postal questionnaire.

A copy of the questionnaire is enclosed for your information.

INVESTIGATOR CONTACT DETAILS (*Principal Investigator)

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Dr L Gilbert, Centre for Infectious Disease & Microbiology, Westmead Hospital, Sydney

Dr David Isaacs, Dept of Immunology & Infectious Diseases, New Children's Hospital Sydney

Dr Don Roberton, Clinical Immunology, Women's' & Children's Hospital, Adelaide

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