MENINGOCOCCAL DISEASE

(meningococcal meningitis, meningococcemia)

REPORTING INFORMATION

- Class A(1)
- Report immediately by telephone
- Requires completion of CDC National Bacterial Meningitis and Bacteremia Case Report (form CDC 52.15, rev. 10/91) - to be sent by the local health department to ODH, Bureau of Infectious Disease Control, 246 N. High Street, PO Box 118, Columbus, OH 43266-0118.

AGENT

Neisseria meningitidis - a Gram-negative diplococcus bacterium with multiple serogroups known to cause invasive disease (A, B, C, X, Y, Z, W-135, and L). Serogroups B, C, and Y are the most prevalent in Ohio. Group A has frequently been associated with epidemics in other parts of the world.

CASE DEFINITION

Clinical description

Meningococcal disease manifests most commonly as meningitis and/or meningococcemia that may progress rapidly to purpura fulminans, shock, and death. However, other manifestations might be observed.

Laboratory criteria for diagnosis

Isolation of *Neisseria meningitidis* from a normally sterile site (e.g., blood or CSF or, less commonly, joint, pleural, or pericardial fluid)

Case classification

Probable: a case with a positive antigen test in CSF or clinical purpura fulminans in the absence of a positive blood culture.

Confirmed: a clinically compatible case that is laboratory confirmed.

Comment

Positive antigen test results from urine or serum samples are unreliable for diagnosing meningococcal disease.

SIGNS AND SYMPTOMS

Invasive meningococcal infection usually results in meningococcemia and/or meningitis. Onset is abrupt in meningococcemia with fever, chills, malaise, prostration, and a rash which can be urticarial, maculopapular, or petechial. In fulminate cases, purpura, disseminated intravascular coagulation, shock, coma, and death (Waterhouse-Friderichsen syndrome) can ensue within several hours despite appropriate therapy. Meningitis presents with altered mental status, seizures in some patients, and meningeal irritation. Individual symptoms vary widely from patient to patient; infants and small children might exhibit only fever and vomiting. The classical symptoms of headache, stiff neck, and confusion occur in less than half of patients. Invasive meningococcal infections can be complicated by arthritis, myocarditis, pericarditis, endophthalmitis, or pneumonia.

DIAGNOSIS

Gram-stained smear of spinal fluid showing gram negative diplococci raises suspicion of invasive meningococcal disease. Diagnosis is confirmed by a culture of the blood and/or spinal fluid. Clinical laboratories should send all *N. meningitidis* isolates from normally sterile sites to the ODH Laboratory for PFGE analysis.

EPIDEMIOLOGY

Source

The upper respiratory tract of humans. Asymptomatic colonization is frequent and provides the focus from which the organism is spread. It is estimated that 5%-25% of a population can be asymptomatic carriers.

Occurrence

Peak attack rates are in children between 3 and 5 months of age with the greatest percentage of cases in children less than five years. Child care centers, preschools, and military camps experience the majority of outbreaks.

Mode of Transmission

Person-to-person through droplets of infected respiratory secretions.

Period of Communicability

The exact period of communicability is unknown, but is probably throughout the duration of the presence of the organism in the upper respiratory tract of those with invasive disease and in contacts who have become asymptomatically colonized with meningococci.

Incubation Period

From 1 to 10 days, most commonly 3 to 4 days.

PUBLIC HEALTH MANAGEMENT

Case

Treatment

Hospitalization is usually required for parenteral antibiotic treatment and vigorous supportive care. Treatment for invasive disease does not eliminate nasopharyngeal carriage of the organism in the index case. It is imperative that carriage of the organism be eradicated before the patient is discharged from the hospital by administering Rifampin in the same dosage as noted below.

Isolation

The Ohio Administrative Code (section 3701-3-13 [P]) states that "a person with meningococcal disease shall be isolated until twenty-four hours after the initiation of effective therapy." Respiratory isolation guidelines apply.

Contacts

Investigation

Identification of contacts is important to determine those requiring chemoprophylaxis. **High risk** contacts for whom chemoprophylaxis is recommended include:

- household contacts, especially young children
- child care, nursery school, and babysitting contacts in the previous 7 days
- anyone who had direct contact with the case's oral secretions through kissing or sharing toothbrushes or eating utensils
- anyone who performed mouth-to-mouth resuscitation on or was unprotected during oral intubation of the case
- anyone who frequently sleeps or eats in the same dwelling as the case

Low risk contacts for whom chemoprophylaxis is not recommended include:

- persons having only casual contact with the case and no direct contact with oral secretions, e.g., school or work mates
- persons who had contact only with a high-risk contact, i.e., no direct contact with the case
- medical personnel who did not have contact with the case's oral secretions

Prophylaxis

All household and child care or preschool contacts should receive prophylaxis, preferably within 24 hours of diagnosis of the index case. Nasopharyngeal cultures are not recommended for screening contacts. They are of no value in making decisions relating to prophylaxis.

Rifampin is the drug of choice for prophylaxis*:

Duration of prophylaxis is two days (48 hrs).

Doses are given every 12 hours for a total of four (4) doses.

Each rifampin dose is:

- 600 mg. for adults
- 10 mg/kg (maximum dose, 600 mg) for children
- 5 mg/kg for infants less than one-month-old

Ciprofloxacin given to adults in a single oral dose of 500 mg is also effective in eradicating meningococcal carriage. Presently, ciprofloxacin is not recommended for persons younger than 18 years of age or for pregnant women.

Prophylaxis is not necessarily completely effective and exposed contacts should remain under medical supervision for one month.

Prevention and Control

A quadrivalent (A, C, Y, and W-135) vaccine is the formulation currently available in the United States. Routine vaccination of civilians with meningococcal polysaccharide vaccine is not recommended. The vaccine is indicated to control outbreaks of disease proven to be caused by one of the serogroups represented in the vaccine. In an outbreak, the serogroup should be determined and the population at risk delineated by neighborhood, school, dormitory, or other reasonable boundary. Although endemic disease is very uncommon above age five years, older children, adolescents, and young adults constitute a higher proportion of cases during epidemics and may warrant vaccination during an outbreak. Contact the Bureau of Infectious Disease Control at ODH (614-466-0265) if 2 or more cases occur within 2 weeks of each other within a county or nearby communities.

Routine immunization with the quadrivalent vaccine is recommended for particular high-risk groups, including individuals with terminal complement component or properdin deficiencies and those with anatomic or functional asplenia. Vaccination may benefit some travelers to countries recognized as having hyperendemic or epidemic meningococcal disease. The vaccine is currently given to all U. S. military recruits. Studies are underway evaluating the usefulness of vaccine for college students. Refer to the ODH Immunization Manual for details.

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* American Academy of Pediatrics. Meningococcal Infections. In: Peter G, ed. *1997 Red Book: Report of the Committee on Infectious Diseases*. 24th edition. Elk Grove Village, IL: American Academy of Pediatrics; 1997:p. 361