

STREPTOCOCCUS PNEUMONIAE, INVASIVE DISEASE

(ISP, pneumococcal infection)

REPORTING INFORMATION

- Class A(3)
- Report by end of work week
- Reporting limited to culture-confirmed cases of bacteremia and/or meningitis, as defined in the director's disease surveillance advisory of 10/1/96
- [Confidential Case Report Card](#) (3812.11, rev. 12/81), [lab report](#) (3833.11), or telephone
- ODH [ISP Surveillance Report](#) form (HEA 3822, rev. 6/98) to be sent by local health department to ODH, Bureau of Infectious Disease Control, 246 N. High Street, PO Box 118, Columbus, OH 43266-0118
- If this is a case of meningitis, complete the CDC [National Bacterial Meningitis and Bacteremia Case Report](#) (CDC 52.15, rev. 10/91)

AGENT

Streptococcus pneumoniae - The pneumococci are lancet-shaped, Gram-positive diplococci. Ninety pneumococcal serotypes, designated by number, have been identified. Most pneumococcal disease is caused by 23 of these serotypes. Certain of these serotypes are prevalent in adults; others are prevalent in children. Serotypes in groups 4, 6B, 9V, 14, 18C, 19F, and 23F are responsible for the majority of ISP infections in children in the United States. Throughout the past two decades several serotypes have developed resistance to penicillin, to which they were formerly highly susceptible. Serotypes 6B, 9V, 14, 19A, 19F, and 23F are the most frequent isolates associated with resistance to penicillin. This antibiotic resistance is known as **DRSP** (drug resistant *Streptococcus pneumoniae*). Factors bringing pressure upon this bacterium to develop resistance include widespread and sometimes indiscreet use of antibiotics, inadequate treatment regimens, and inadequate patient compliance (failure to complete treatment). Because antibiotics for treatment of pneumococcal disease are often, of necessity, selected empirically, surveillance to identify the character and extent of this resistance is needed. A 23-valent pneumococcal vaccine is available to provide protection against the most prevalent serotypes, which are represented in the vaccine.

CASE DEFINITION

Clinical description

Streptococcus pneumoniae causes many clinical syndromes, depending on the site of infection (e.g., acute otitis media, pneumonia, bacteremia, or meningitis). [In Ohio, only meningitis and bacteremia are reportable. Even if culture confirmed, infections of other sites are not reportable in Ohio unless the pneumococcus has been identified in blood or CSF]

Laboratory criteria for diagnosis

Isolation of *S. pneumoniae* from a normally sterile site (e.g., blood, cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid). [In Ohio, isolation of this agent from blood or CSF is reportable. Laboratory reports of *S. pneumoniae* from blood or CSF must identify tests for antibiotic sensitivity and results of these tests, when performed.]

Case Classification [Ohio]

Confirmed: a clinically compatible case that is laboratory confirmed. Within the total number of cases confirmed in this manner, a subcategory of cases are identified as **DRSP** cases.

SIGNS AND SYMPTOMS

Onset of invasive *S. pneumoniae* disease is usually sudden with high fever, lethargy or coma, and signs of meningeal irritation. Case-fatality rates for some high-risk patients have been reported to exceed 40% for bacteremia and 55% for meningitis, despite appropriate antimicrobial therapy.

DIAGNOSIS

See case definition. Clinical labs are asked to send all *S. pneumoniae* isolates from a normally sterile site that are of intermediate or complete resistance to penicillin to the ODH Lab.

If a patient has received the pneumococcal vaccine and the invasive pneumococcal infection is believed to be the result of a vaccine failure, the isolate should be submitted to the CDC for serotyping. Please send all *S. pneumoniae* isolates from patients in which vaccine failure is suspected to the ODH Laboratories along with the CDC [DASH Microbiology form](#) (CDC 50.34, rev. 11-90). These isolates will be forwarded to the CDC for serotyping. Please note that the CDC will only accept isolates for serotyping if they are the result of a vaccine failure.

EPIDEMIOLOGY

Source

Humans are the reservoir of the pneumococci, which are commonly found in the upper respiratory tract of healthy persons throughout the world.

Occurrence

Pneumococcal infections are among the leading causes worldwide of illness and death for young children, persons who have underlying debilitating medical conditions, and the elderly. Each year in the United States, pneumococcal disease is estimated to account for 3,000 cases of meningitis, 50,000 cases of bacteremia, 500,000 cases of pneumonia, and 7,000,000 cases of otitis media. Annual incidence in Ohio of reportable culture-confirmed invasive disease (bacteremia and meningitis) is likely in excess of 2,000 cases.

Mode of Transmission

Pneumococci are transmitted from person-to-person by droplet spread, by direct oral contact, and indirectly through articles freshly soiled with respiratory discharges. Although these routes of transmission are easily accomplished, illness among casual contacts and attendants of patients is infrequent.

Period of Communicability

Communicability associated with respiratory infection likely persists while pneumococci are present in respiratory secretions. Treatment with an antibiotic to which the infecting organism is sensitive can be expected to terminate communicability within 24 hours.

Incubation Period

The incubation period varies by type of infection and can be as short as 1 to 3 days.

PUBLIC HEALTH MANAGEMENT

Case

The principal role of local and state public health agencies in the management of invasive pneumococcal disease is to contribute to the descriptive epidemiology of disease caused by this agent. This is accomplished by reporting cases of confirmed invasive disease, and associated drug resistance, in order that regional and statewide trends in disease incidence and results of antibiotic resistance can be identified. Publication of compilations of disease incidence and antibiotic susceptibility trends is useful to clinicians in the selection of empiric treatment regimens likely to be effective.

Field investigation of cases of pneumococcal disease and their contacts in an attempt to identify source of infection is ordinarily of no practical value and is not recommended.

Isolation

The Ohio Administrative Code ([3701-3-13 \[Y\]](#)) states "a person with a streptococcal infection shall be excluded from school or child care center for twenty-four hours after the initiation of antimicrobial therapy."

Contact

No prophylactic treatment has been devised for contacts of cases of invasive pneumococcal infections. Encourage a high index of suspicion and early medical care for contacts who develop cough, chills, fever, and other nonspecific symptoms within a few days after contact with a case. Quarantine of contacts is not warranted.

Prevention and Control

Avoid overcrowding in schools, day care centers, residence facilities, and other institutions. Immunization of high risk persons with the 23-valent pneumococcal vaccine is recommended. These recommendations can be found in the document "Prevention of Pneumococcal Disease" from the Advisory Committee on Immunization Practices (ACIP) *MMWR* 1997;46(RR-8).