STREPTOCOCCUS PNEUMONIAE, INVASIVE DISEASE

(ISP, Pneumococcal Infection)

REPORTING INFORMATION

- **Class B**: Report by the end of the next business day after the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Reporting Form(s) and/or Mechanism: <u>Ohio Confidential Reportable Disease</u> form (HEA 3334, rev. 1/09), <u>Positive Laboratory Findings for Reportable</u> <u>Disease form</u> (HEA 3333, rev. 8/05), the local health department via the Ohio Disease Reporting System (ODRS), or telephone.
- <u>ODH Invasive Streptococcus pneumonia (ISP) Surveillance Report</u> (rev. 6/98) is available for use to assist in local disease investigation. Information collected from the form should be entered into the Ohio Disease Reporting System (ODRS) and not sent to the Ohio Department of Health (ODH), unless otherwise requested.
- Key fields for ODRS reporting include: specimen type and susceptibility information.

AGENT

Streptococcus pneumoniae (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.

CASE DEFINITION

Clinical Case Definition

Streptococcus pneumoniae causes many clinical syndromes, depending upon the site of infection (e.g. acute otitis media, pneumonia, bacteremia, meningitis).

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). Laboratory reports of *S. pneumoniae* from sterile sites must identify tests for antibiotic sensitivity and results of these tests, when performed.

Only invasive cases of *S. pneumonia* are reportable. Please do not report cases from non-sterile sites (e.g. sputum, urine, skin).

Case Classification

Two ISP reporting categories exist in Ohio:

- 1. Cases that are susceptible or where the antimicrobial susceptibilities are not available/unknown and
- 2. Cases demonstrating resistance or intermediate resistance to one or more antibiotics.

<u>Suspect</u>*: A clinically compatible case that is not yet laboratory confirmed and is not epidemiologically linked to a confirmed case.

<u>Probable</u>*: A clinically compatible case that is epidemiologically linked to a confirmed case.

<u>Confirmed</u>: A clinically compatible case that is laboratory confirmed.

<u>Not a Case</u>: This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

Comment: Confirmation is based on laboratory findings. Clinical illness is not required.

* This case classification can be used for initial reporting purposes to ODH as the Centers for Disease Control and Prevention (CDC) has not developed a classification.

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.

EPIDEMIOLOGY

Source

Humans are the reservoir of 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.

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 1-3 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.

<u>Isolation</u> None.

Contacts

No prophylactic treatment is recommended for contacts of cases of invasive pneumococcal infections. Encourage a high index of suspicion and early medical care for contacts that 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, child care centers, residence facilities and other institutions. Immunization with either the 13-valent pneumococcal conjugate vaccine (PCV) or the 23-valent pneumococcal polysaccharide vaccine (PPV), as appropriate, is recommended. Before the introduction of pneumococcal conjugate vaccine to prevent infection, many types of pneumococcal bacteria were becoming resistant to some of the antibiotics used to treat pneumococcal infections. Antibiotic-resistant pneumococcal infections have significantly declined, but remain a concern in some populations. Appropriate use of antibiotics may also slow or reverse emerging drug resistant found among pneumococcal infections.

For specific vaccine information, see the ODH Vaccine Protocol Manual.

Disease Fact Sheet Streptococcus pneumonia (Pneumococcal disease)

What is pneumococcal disease?

Pneumococcal disease is defined as infections that are caused by the bacteria *Streptococcus pneumoniae*, also known as pneumococcus. The most common types of pneumococcal infections include middle ear infections, sinus infections, lung infections (pneumonia), blood stream infections (bacteremia), and meningitis. Some of these infections are considered to be "invasive". Invasive disease means that germs invade parts of the body that are normally free from germs. For example, pneumococcal bacteria can invade the bloodstream, causing bacteremia, and/or tissues and fluids surrounding the brain and spinal cord, causing meningitis. When this happens, disease is usually very severe, causing hospitalization or even death.

Which children are most likely to get pneumococcal disease?

Young children are much more likely than older children and young adults to get pneumococcal disease. Children under 2 years of age, children in group child care, and children who have certain illnesses (for example, sickle cell disease, HIV infection, chronic heart or lung conditions) are at higher risk than other children to get pneumococcal disease. In addition, pneumococcal disease is more common among children of certain racial or ethnic groups, such as Alaska Natives, American Indians living in certain communities, and African-Americans, than among other groups.

How common is pneumococcal disease?

Each year in the United States, pneumococcus causes more than 4,800 cases of blood stream infections (bacteremia), meningitis, or other invasive disease in children younger than 5 years of age. Children under 2 years of age average more than 1 middle ear infection each year, many of which are caused by pneumococcus. Pneumococcus is the most common cause of bacteremia, pneumonia, meningitis, and otitis media (middle ear infections) in young children.

Which children are at increased risk?

Children at increased risk of pneumococcal infections include those with anatomic or function asplenia (including sickle cell disease), patients taking immunosuppressive drugs, those with congenital and acquired immune deficiency (including HIV infections), children with cochlear implants, and those with chronic renal disease. Some American Indian, Alaska Native and African American children may also be at increased risk. Children younger than 5 years of age in out-of-home day care are at increased risk (approximately 2 fold higher) of experiencing invasive pneumococcal infections than other children.

How serious is pneumococcal disease?

Invasive pneumococcal disease may be a very serious illness in young children. Meningitis is the most severe type of pneumococcal disease. Of children younger than 5 years of age with pneumococcal meningitis, about 5% will die of their infection and others may have long-term problems such as blindness or hearing loss. Many children with pneumococcal pneumonia or blood stream infections will be ill enough to be hospitalized. About 1% of children with blood stream infections or pneumonia with a blood stream infection will die of their illness. Sinus infections and ear infections are usually mild and are much more common than serious forms of pneumococcal disease. Some children, however, develop recurrent ear infections and may need tympanostomy tubes (ear tubes).

How is pneumococcal disease spread?

The bacteria that cause pneumococcal disease are spread through contact with persons who are ill or healthy persons who carry the bacteria in the back of the nose. Transmission is mostly through the spread of respiratory droplets from the nose or mouth of a person with a pneumococcal infection. It is common for people, especially children, to carry the bacteria in their throats without being ill from it.

How is pneumococcal disease treated/cured?

Pneumococcal disease is treated with antibiotics. Before the introduction of pneumococcal conjugate vaccine (PCV) to prevent infection, many types of pneumococcal bacteria were becoming resistant to some of the antibiotics used to treat pneumococcal infections. Antibiotic-resistant pneumococcal infections have significantly declined, but remain a concern in some populations. Appropriate use of antibiotics may also slow or reverse emerging drug resistant found among pneumococcal infections.

Who needs to be vaccinated with pneumococcal vaccines?

The pneumococcal conjugate vaccine (PCV13 or Prevnar 13®) protects against 13 types of pneumococci (the bacteria that cause pneumococcal disease). It is recommended for use in infants and young children. The vaccine should be given to all infants at 2, 4, and 6 months of age, followed by a booster dose at 12 through 15 months of age. Previously unvaccinated, healthy children 24 months through 4 years of age only need to receive one dose of this vaccine. Additional doses of PCV13 may be recommended, depending on the child's age and health status. For more information, please consult the CDC's Advisory Committee on Immunization Practice's recommendations or your child's healthcare provider.

The pneumococcal polysaccharide vaccine (PPSV), Pneumovax®, is a 23-valent polysaccharide vaccine that is currently recommended for use in all adults who are 65 years and older and for persons who are 2 years and older and at high risk for disease such as persons with sickle cell disease, HIV infection, or other immunocompromising conditions. It is also recommended for use in adults 19 through 64 years of age who smoke cigarettes or who have asthma and adults living in nursing homes or long-term care facilities.