State of Alaska Epidemiology Bulletin

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Adolescent Pertussis Plagues Southeast Alaska

In June 2000, a case of pertussis was reported to the Section of Epidemiology. The case occurred in a 19-year-old female from a small Southeast Alaska village. On June 5, she developed a paroxysmal cough; a nasopharyngeal swab taken that day was culture positive for *Bordetella pertussis* at the State Public Health Laboratory-Anchorage. Other symptoms included vomiting associated with the cough, temperature of 102° F, and episodes of apnea. Investigation led to the identification of 10 cases among contacts of the initial case. Two of the 11 cases were culture confirmed, and nine met a clinical case definition and were epidemiologically linked to a laboratory confirmed case. The median age of the cases was 12 years (range: 7 months-19 years).

Discussion

This outbreak typifies what is seen nationally with pertussis. An increasing proportion of pertussis cases occurs among adolescents and adults. Some of these cases are associated with a lack of immunizations or waning immunity. If children are not immunized during their first 6 years, the window of opportunity is lost, because pertussis vaccine is not recommended for persons older than 6 years of age.

This outbreak brings to 18 the number of pertussis cases in Alaska during 2000. During 1995 to 1999, an average of 8 cases were reported per year. In addition to the 11 cases discussed above, two additional clinical cases of pertussis were recently reported in another Southeast community connected to an ongoing pertussis outbreak in British Columbia.

The most effective means of preventing pertussis is for all children less than age 7 years to be up to date with their pertussis immunizations. Acellular pertussis vaccine (a component of diphtheria, tetanus, pertussis vaccine, DTaP), contains purified, inactivated components of *B. pertussis* cells and was licensed for the primary series in 1996. The side effects of DTaP are milder than the previous whole cell vaccine. The vaccine series consists of doses of DTaP at 2, 4 and 6 months of age and boosters at 15-18 months and 4-6 years of age. (1)

Pertussis begins with mild upper respiratory tract symptoms and can progress to severe paroxysms of cough. Fever is absent or minimal. Adolescents and adults with pertussis generally have a milder illness resembling an upper respiratory infection or an acute cough illness without paroxysms, whoop, or post-tussive vomiting (Table 1). Such cases often go unrecognized or are diagnosed as asthma or bronchitis. Duration of uncomplicated cases is 6-10 weeks. The contagious period lasts from 7 days following exposure to 3 weeks after onset of paroxysms with maximum contagiousness occurring early in the illness. Adolescents and adults with mild pertussis may act as reservoirs and can transmit the disease to children under 3 years of age, where illness is more severe (including seizures, pneumonia, and encephalopathy) and the mortality rate is higher.

Diagnosis

The "gold standard" test for pertussis is culture. Specimens should be obtained from the posterior nasopharynx using a Dacron or calcium alginate swab (not cotton) and plated directly onto selective media. *B. pertussis* can be difficult to culture. In the absence of antibiotic treatment, culture positivity may be greater than 50% if specimens are obtained within the first 2 weeks of illness; after 6 weeks the rate is less than 20%. Negative cultures are common, particularly in patients late in the course of the disease or who are receiving antibiotics. Serologic testing has not been standardized, and due to the lack of association between antibody levels and immunity, results are difficult to interpret.

Recommendations

1. The medical management of patients with pertussis is primarily supportive, although antibiotics (erythromycin) are of some value if given early. Patients with possible pertussis should be kept in respiratory isolation until after the completion of 5 days of antibiotics. Isolation of patients from household members is usually not feasible; however, patients should refrain from direct contact with persons outside the household during this time.

2. Close contacts under 7 years of age should be offered a dose of DTaP vaccine if they have either not received 4 doses or not had a dose within the past 3 years.

3. Household and close contacts to a confirmed case of pertussis, regardless of age and vaccination status, should receive erythromycin 40-50 mg/kg per day orally in 4 divided doses; max. 2 g/day for 14 days. Prophylaxis should be initiated as soon as possible and no later than 3 weeks after exposure to an infectious case.

4. Physicians and other health care providers should maintain a high index of suspicion for pertussis, take a nasopharyngeal specimen for culture, and notify the Section of Epidemiology of suspected cases (907-269-8000 or 1-800-478-0084 after hours). Special pertussis culture media is available from the State Public Health Laboratory-Anchorage.

5. The most effective way to control pertussis is to prevent cases by immunizing children. Immunization records of all children less than 7 years of age should be reviewed and children should be brought up to date with their DTaP immunizations.

Reference:

1. Section of Epidemiology. 2000 Alaska Immunization Recommendations, *Epidemiology Bulletin* No. 1, January 14, 2000.

Table 1. Features of pertussis in adolescents and adults

Symptoms: Rhinorrhea, malaise, low grade fever, pharyngeal discomfort. Followed by a paroxysmal cough often associated with sweating, facial flushing, and even syncope. The cough is productive with watery secretions and thick mucus plugs.

Treatment: Antibiotics will not affect the course of illness but are recommended to limit the spread of the organism to others. The drug of choice is erythromycin 40-50 mg/kg per day orally in 4 divided doses; max. 2 g/day for 14 days. Azithromycin 10-12 mg/kg per day orally in 1 dose or clarithromycin 15-20 mg/kg per day in 2 divided doses; max. 1 g/day for 5-7 days may be effective. The newer macrolides and trimethoprim-sulfamethoxazone are alternatives, but their efficacy has not been proven.

Chemoprophylaxis: Erythromycin 40-50 mg/kg orally in 4 divided doses; max. 2 g/day for 14 days is recommended for all household contacts and other close contacts such as those in childcare, irrespective of age and immunization status.

(Dr. Mark Raine, ER physician from Ketchikan General Hospital submitted the original specimen to the State Public Health Laboratory. Contributed by Sue Anne Jenkerson, RNC, MSN, FNP and Gail Stewart, MS, ANP, Section of Epidemiology.)