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AN EPIDEMIOLOGY PUBLICATION OF THE OREGON DEPARTMENT OF HUMAN SERVICES

PERTUSSIS — WHOOPING IT UP IN OREGON

SOMEWHERE out in God's country in late July, Daniel Ward* started experiencing chills and a fever. He'd spent the week building a swing set for his 2-year-old granddaughter, to make her feel special a few weeks after her baby sister was born. Within two days, Daniel had what he thought was a bad cold. Daniel went to his doctor, who didn't think it was serious.

Daniel got worse. He developed a deep, gasping cough that left him dizzy and weak. "You cough until there is absolutely no more air in your lungs, and then there is this horrible whoop," Daniel reported. "I spent eight days at the dining room table, sitting in a chair with my head resting on pillows because I couldn't lie down." Lying down made the cough worse. Standing up made the cough worse. He couldn't sleep. After Daniel's granddaughters had been positively diagnosed with pertussis, Daniel took his cough back to the doctor's office. The doctor put her hands on her hips and said, "You couldn't have whooping cough."[1]

Or could he? Mr. Ward is not alone; two-thirds of pertussis cases reported in Oregon during 2003 were in adolescents and adults. Although some have found pertussis in as many as 30% of adults with prolonged cough, anecdotes like this one suggest that some of us are still in denial.[2] This *CD Summary* describes changes in the epidemiology and treatment of pertussis in Oregon and updates readers on available vaccines.

THE DISEASE

Pertussis, an acute bacterial infection characterized by paroxysms of coughing, inspiratory whoop, apnea, and post-tussive vomiting, can be more than annoying to adults.[3] After an incubation period of 7–10 days, it begins with catarrh and coryza, followed in a day or two by an insidious cough. It is difficult to diagnose during this period because symptoms resemble the common cold; but the cough becomes more severe and persists for up to 6 weeks.[3]

Pertussis complications, which disproportionately affect infants, include pneumonia, encephalopathy, seizures and death.[3]

Adults with pertussis are thought to be the principal source of infant infections, but diagnosis is difficult in adults. It is estimated that 12%–32% of prolonged cough illnesses in adolescents and adults are due to *Bordetella pertussis*.[2] However, because their illnesses are mild, adults often delay in seeking care. Furthermore, culture and PCR are less likely to be positive after several weeks of illness. For all of these reasons, missed cases of adult pertussis represent both a major source of transmission and a substantial portion of the disease burden.[4]

OREGON EPIDEMIOLOGY

This year Oregon experienced a 30-year high in pertussis reports—422 to date. The majority have been reported from Lane, Jackson, and Klamath counties. Cases had a median age of 13 (range 0–69) years; 53% were female. Twenty-nine (7%) cases were hospitalized; 79% of those hospitalized were <4 months of age. One patient died. Cases are increasingly reported in persons ⩾10 years of age, whose immunity to pertussis from early childhood vaccination is waning[5]; 39% of cases during 2003 were adults, compared with 16% during 1991–2002.

CLINICAL EVALUATION, TREATMENT AND PROPHYLAXIS

Think of pertussis when evaluating persons with spasmodic or paroxysmal coughing, post-tussive vomiting or prolonged cough (⩾2 weeks). Our two preferred laboratory tests for pertussis are culture and PCR testing of nasopharyngeal specimens. Culture is much less sensitive than PCR. In cases without known exposure to others with pertussis, laboratory testing can help guide prudent antibiotic use.

Nasopharyngeal carriage of *Bordetella pertussis* can be eradicated quickly with azithromycin or erythromycin.[6] An alternative regimen is 14 days of trimethoprim/ sulfmethoxazole or 10 days of clarithromycin, (Table, *verso*).[7] The same drugs and durations are used for post-exposure prophylaxis in children and adults, typically within three weeks of their last exposure; but for infants, prophylaxis should be considered out to six weeks following exposure.

Prophylaxis should be provided to all household members of cases, and DTaP vaccine should be given to children 2 months–7 years of age in the patient's household if they are not up to date. Secondary attack rates of 80% in susceptible household contacts of pertussis cases are common.[8] Prophylaxis prevents secondary cases, severe illness, complications, and transmission to susceptible children. Finally, the local health department should be notified promptly when a clinical diagnosis of pertussis is made.

PRIMARY PREVENTION

Since pertussis was last discussed in these pages in 1998, newer vaccines more effective against pertussis have been licensed, and others have ceased to be. There were pertussis vaccine shortages from 2000 through 2002.[9] Through 1998, Oregon's immunization rates had been increasing. Unfortunately, the rise in rates among 2-year-olds in Oregon and the US has stalled. Many attribute this to more families choosing not to immunize their children, along with the vaccine shortages.[10]

Current childhood vaccines are very safe, and, while not 100% protective, remain the best way to prevent pertussis

* Not his real name.

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Antibiotics for Treatment and Post-exposure Prophylaxis of Pertussis

Azithromycin	× 5 days	**Adults**	500 mg p.o. on day 1; then 250 mg p.o. q.d. on days 2–5.
		Children	≥6 months of age: 10–12 mg/kg in single dose on day 1; and then 5 mg/kg/d p.o. q.d. on days 2–5.
Erythromycin	x14 days	**Adults**	500 mg p.o. q.i.d.
		Children	40–50 mg/kg/d p.o. in 4 divided doses, maximum 2g/d.
Trimethoprim/ sulfmethoxazole	x 14 days	**Adults**	160 mg/800 mg (1 double-strength tablet) p.o. b.i.d.
		Children	≥2 months of age: 4 mg/kg trimethoprim and 20 mg/kg sulfmethoxazole p.o. b.i.d.
Clarithromycin	x 10 days	**Adults**	500 mg p.o. b.i.d.
		Children	≤6 months of age: 7.5–10 mg/kg p.o. b.i.d., maximum 1g/d.

in our most vulnerable population—viz., infants. Three pertussis vaccines are currently licensed in the United States for children 6 weeks through 6 years of age: Infanrix® (GlaxoSmith-Kline), Tripedia® (Aventis), and Daptacel® (Aventis). All three are acellular vaccines, and each differs slightly in formulation from the others. In addition, Infanrix® is part of the combination vaccine Pediarix,® which immunizes against diphtheria, tetanus, pertussis, polio and Hepatitis B.

Of 245 pertussis cases <10 years of age reported in Oregon during 2002–2003, 126 (51%) had not been immunized as recommended for their age. Sixty-five (52%) of these children had *never* received any pertussis vaccine. Parents of 37% of these completely unvaccinated children had claimed a religious exemption to vaccination; another 12% declined vaccination for concerns about safety.

CONCLUSION

We do not understand the increase in pertussis cases at this time, but improved media attention, astute physicians, and the diligent efforts of local public health nurses hot on the trail of case investigations deserve at least some of the credit for Oregon's robust tally. In addition, adults are getting diagnosed in record numbers. Whether the increase in cases is due to more disease, better surveillance, or both, pertussis will keep us busy until an effective adult vaccine is available and implemented.

REFERENCES

1 Boulé M. Pertussis outbreak is as simple as 'huggies' with granddad. The Oregonian, September 28, 2003, reprinted with permission from M. Boulé.
2 Cherry JD. Epidemiological, clinical, and laboratory aspects of pertussis in adults. Clin Infect Dis 1999; 28:S112–7.
3 Hewlett EL. Bordetella Species. In: Mandel GL, Bennett JE, Dolin R, eds. Principles and Practice of Infectious Diseases-5th ed. 2000:2414-22.
4 Centers for Disease Control and Prevention. Pertussis Outbreak Among Adults at an Oil Refinery — Illinois, August—October 2002. MMWR Morb Mortal Wkly Rep. 2003;52(1):1–4.
5 Güriş D, Strebel PM, Bardenheier B, Brennan M, Tachdjian R, Finch E, Wharton M, and Livengood J. Changing Epidemiology of pertussis in the United states: Increasing reported incidence among adolescents and adults, 1990–1996. Clin Infect Dis 1999;28:1230–7.
6 Pichichero ME, Hoeger WJ, Casey JR. Azithromycin for the treatment of pertussis. Pediatr Infect Dis J. 2003 Sep;22(9):847–9.
7 Lebel MH, Mehra S. Efficacy and safety of clarithromycin versus erythromycin for the treatment of pertussis: a prospective, randomized, single blind trial. Pediatr Infect Dis J 2001; 20(12): 1149–54.
8 Atkinson W, Wolfe C (eds). Epidemiology and Prevention of Vaccine-Preventable Diseases. 7th Edn. Atlanta, GA: Centers for Disease Control, 2002: 67–8.
9 Centers for Disease Control and Prevention. Notice to Readers: Resumption of Routine Schedule for Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine and for Measles, Mumps, and Rubella Vaccine. MMWR Morb Mortal Wkly Rep. 2002.51(27):598–9. At: *http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5127a5.htm*
10 Centers for Disease Control and Prevention. Status report on the Childhood Immunization Initiative: national, state and urban area vaccination coverage levels among children aged 19-35 months — United States, 2001. MMWR Morb Mortal Wkly Rep. 2002.51(30):664–6. At: *http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5130a2.htm*

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