CD Summary

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OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

INVASIVE MENINGOCOCCAL DISEASE

Leukocytes. . .aggregate together in dense masses, occluding capillaries and shutting off the blood supply. Complement is switched on. . . .Vessels become hyper-reactive to epinephrine so that physiologic concentrations suddenly possess necrotizing properties. . . . All of this seems unnecessary, panic-driven. There is nothing intrinsically poisonous about endotoxin, but it must look awful, or feel awful when sensed by cells. Cells believe that it signifies the presence of gram-negative bacteria, and they will stop at nothing to avoid this threat.

– Lewis Thomas, The Lives of a Cell

Invasive meningococcal disease is nasty. It is caused by the Gram-negative diplococcus *Neisseria meningitidis* and can manifest itself as meningitis or bloodstream infection. Case fatality is 9%–12% even with appropriate treatment. As many as 20% of survivors suffer permanent injuries that can include lost digits or limbs, loss of hearing, or other neurologic damage.

Although as many as 10% of the population harbor the meningococcus in the nasopharynx,[1] the disease is, fortunately, rare: 0.3–0.5 cases per 100,000 population per year.[2] Disease is typically sporadic, and <5% of U.S. cases occur as part of outbreaks.[3]

This issue of the *CD Summary* reviews trends for meningococcal disease in Oregon, vaccination recommendations, and a recent cluster of invasive meningococcal illness in Crook County.

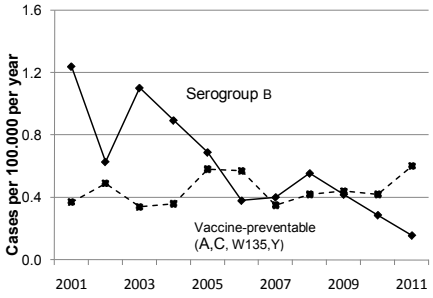
GEOGRAPHY & HISTORY

Meningococcal disease is endemic in the Sahel region of sub-Saharan Africa, and epidemics with attack rates of 100–800 cases/100,000 have been reported. Epidemics in the Sahel often involve serogroup A meningococcus. Here in the U.S., outbreaks caused by serogroup A were common before the 1950s, with attack rates as high as 310 per 100,000.[2] In the latter half of the 20th century, the incidence of meningococcal disease declined, and serogroup A all but vanished from the U.S. Since 2000, the incidence has remained ≤0.5/100,000.[3]

MENINGOCOCCUS IN OREGON

During 1987–1992, the incidence of meningococcal disease in Oregon averaged 2.0 cases per 100,000 residents per year. During 1993–1994, due to an upsurge in (non-vaccine-preventable) serogroup B disease, the incidence leapt to 4.0 per 100,000 — the highest since 1943.[4] Since 1994, the incidence declined steadily, stabilizing at about 35 cases/year since 2007. Serogroup B's dominance here has receded (Figure 1), but it still accounts for a plurality of cases in Oregon (Figure 2). Rates of illness caused by serogroups included

Figure 1. Invasive meningococcal disease in Oregon, by serogroup



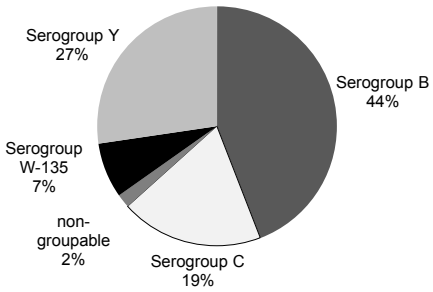
in the tetravalent* vaccine — C, Y and W-135 — have held steady, despite the 2005 Advisory Committee on Immunization Practices (ACIP) recommendation for universal vaccination of teens.[5] Age-specific incidence for mening is highest among children 0–4 years of age, with an additional spike among teens. There is also a seasonal peak in late fall and winter (Figure 3, *verso*).

POST-EXPOSURE PROPHYLAXIS

Household contacts of cases are briefly at much higher risk for illness, with an attack rate of 0.3%–1%. To prevent illness in close contacts, local health department staff identify all persons with ≥4 hours' cumulative exposure to a case within the week prior

* Serogroup A is also in the vaccine but is virtually never seen in the U.S.

Figure 2. *N. meningitidis* isolates, by serogroup, Oregon, 2007–2011 (n=161)



to the case's onset. These close contacts should get antimicrobial prophylaxis† to eradicate nasopharyngeal colonization with the meningococcus before it causes invasive disease. To be on the safe side, any person directly exposed to the case's nasopharyngeal secretions (e.g., through kissing or mouth-to-mouth resuscitation) is also advised to take prophylaxis. On the other hand, health care workers who haven't had contact with secretions are not at risk and do not benefit from prophylaxis.

VACCINATION

There are currently three tetravalent meningococcal vaccines on the US market. Meningococcal vaccination has been recommended for adolescents 11–18 years old, as well as persons up to age 55 who are at increased risk for meningococcal disease, including college freshmen living in dormitories, microbiologists who are regularly exposed to *N. meningitidis*, military recruits, and persons who travel or live in countries where meningococcal disease is hyperendemic or endemic. ACIP recently recommended an adolescent booster dose 3–5 years after the first dose, if received by 16 years of age; and a 2-dose primary series for infants 9–23 months of age‡ who are at increased risk for the disease.[6-7]

Records in Oregon's "ALERT" Immunization Information System indicate that, as of January 2012, 52% of 11–17 -year olds in Oregon had been vaccinated against mening.

† Generally, rifampin, ciprofloxacin or ceftriaxone.

‡ Only Menactra® is currently approved for use in this age group.

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COMMUNITY OUTBREAKS

"Outbreaks" of meningococcal disease are uncommon but occasionally reported, though it can be difficult to ascertain whether a given report represents a coincidental clustering of cases or a true focus of increased risk. CDC's definition of a "community outbreak" is 3 or more cases of meningococcal disease of matching serogroup in a three-month period among persons who live in the same area but who are not close contacts of each other and who don't share a common affiliation. The primary disease attack rate has to be ≥10 cases/100,000 persons. Outbreaks in the United States almost always involve serogroup C strains.[8] When a cluster of invasive meningococcal disease meets these criteria, expanded vaccination efforts may be appropriate.[5]

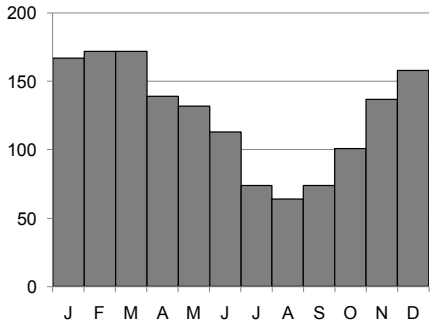
CROOK COUNTY CASES

In early March 2011, a male teenager in Prineville became ill with fever and a petechial rash; his blood culture grew meningococcus. The following week, a Prineville man in his early 20s also became critically ill with meningococcal infection. Isolates from both patients proved to be *N. meningitidis*, serogroup C. A few days later in Deschutes County, an infant fell ill with meningococcal symptoms; but the infant's illness proved to have been caused by serogroup B.

All was quiet in Crook County until November, when a Prineville woman in her early 20s was hospitalized with fever, vomiting, and a stiff neck, and serogroup C meningococcus was isolated from her blood. Then in late January 2012, a Prineville infant with high fever also had meningococcus isolated from blood. The following week, a Prineville teen developed fever, headache and stiff neck; *N. meningitidis* was isolated from her blood.

With the serogroup results pending on these last two cases, local public health staff notified health care providers about the three cases, suggesting that they be on the lookout for more cases and asking them to promote vaccination in teens and other ACIP-recommended groups. Meanwhile,the cases were re-interviewed to find any previously unrecognized links among them. None were identified.

Figure 3. Meningococcal disease, by month, Oregon, 1988–2011



On January 31 and February 2, 2012, respectively, the infant's and the teenager's isolates were reported out as serogroup C, raising the Prineville serogroup C tally to three in three months (and five since March 2011). Because all five cases were <25 years of age, the Crook County Health Department recommended vaccination of all persons 9 months through 25 years of age who lived, worked, attended school or attended day care in Prineville.

Healthcare providers responded: by February 8, more than 1,500 persons in the target group had been immunized as part of the expanded vaccination campaign. As this article goes to press, vaccination by public health, medical offices and pharmacies is still going strong. Time will tell whether it stops the outbreak.

FOR MORE INFORMATION

- Oregon disease reporting and surveillance data: 971-673-1111; *http://public.health.oregon.gov/DiseasesConditions/DiseasesAZ/Pages/disease.aspx?did=51*
- ACIP recommendations: *www.cdc.gov/vaccines/pubs/ACIP-list.htm*
- CDC immunization schedules 2012; *www.cdc.gov/vaccines/recs/schedules/*
- Oregon Immunization ALERT; *www.immalert.org/new/*

REFERENCES

1. Greenfield S, Sheehe PR, Feldman HA. Meningococcal carriage in a population of "normal" families. J Infect Dis 1971;123:67–73.
2. CDC. Meningococcal disease. In: Roush SW, McIntyre L, Baldy LM, eds. Manual for the Surveillance of Vaccine-Preventable Diseases. 5th ed. Atlanta, Ga.: CDC; 2011. p. 1–11.
3. CDC. Meningococcal disease. In: Atkinson W, Wolfe S, Hamborsky J, eds. Epidemiology and Prevention of Vaccine-Preventable Diseases. 12th ed. Washington, DC: Public Health Foundation; 2011. p. 193–204.
4. CDC. Serogroup B meningococcal disease — Oregon, 1994. MMWR 1995;44:121–4.
5. CDC. Prevention and control of meningococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2005;54 (RR-7):1–21.
6. CDC. Updated recommendations for use of meningococcal conjugate vaccines — Advisory Committee on Immunization Practices (ACIP), 2010. MMWR 2011;60:72–6.
7. CDC. Recommendation of the Advisory Committee on Immunization Practices (ACIP) for use of quadrivalent meningococcal conjugate vaccine (MenACWY-D) among children aged 9 through 23 months at increased risk for invasive meningococcal disease. MMWR 2011;60:1391–2.
8. Rosenstein NE, Perkins BA, Stephens DS, Popovic T, Hughes JM. Meningococcal disease. NEJM 2001;344:1378–88.