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Varicella Daycare Center Outbreak -- Kenai Peninsula

Introduction

On February 26, the Kenai Public Health Center notified the Section of Epidemiology about cases of varicella (chickenpox) in immunized children from two child care facilities (facility A in Kenai; facility B in Soldotna) and one elementary school in Kenai. The Section of Epidemiology investigated, including chart reviews of varicella case-patients, lot numbers of administered vaccine, and school and day care facility vaccination records and disease control policies.

Results

Twenty (67%) of the 30 reported cases of varicella had been immunized with varicella vaccine prior to this outbreak. Among the 20 immunized case-patients, parents or facility personnel described mild disease (≤ 50 lesions) with low grade or no fever. The 10 unimmunized case-patients had moderate to severe disease, with fever and 50 to 500 lesions. Thirteen different vaccine lots were used to vaccinate 15 of the cases. Vaccine lot numbers were unavailable for five children. Because immunizations from multiple lots were administered by several different providers, it is unlikely that vaccine shortage and handling problems resulting in inactivating the vaccine played any role in this outbreak.

In the elementary school, 11 cases (3.4%) occurred among 322 students. In child care facility A, two cases (3.4%) occurred among 58 children. In both the school and facility A, there was no second generation of cases. In child care facility B, 17 (34%) of 50 children developed varicella over a 4-week period, representing ongoing transmission of varicella. Of the 17 cases at facility B, 11 were vaccinated and 6 were not.

Child care facility B initially attempted to control transmission of varicella by cohorting ill children. Of the six unvaccinated case-patients, two were out of compliance with state immunization regulations, one child was too young to be immunized, and three children had religious exemptions.

Transmission and infectivity

The varicella zoster virus (VZV) is highly communicable and is transmitted by the airborne route. Persons with varicella are infectious from 2 days before to 4-5 days after rash onset, or until all lesions form crusts. Varicella is most frequent among 1-6 years old children. More than 90% of adults are immune.¹

Recommendations for vaccination

Varicella zoster vaccine (VZV) was licensed in the U.S. in 1995. The Alaska Immunization Program began providing varicella vaccine for children in July 1998.

Table 1: Advisory Committee on Immunization Practices (ACIP) recommendations for administration of varicella vaccine^{1,2}

- All children age 12-18 months,
- All susceptible* children before age 13 years,
- Susceptible* persons ≥ 13 years if at high risk for exposure to, or transmission of varicella, including:
 - Contacts of people at high risk for serious complications (e.g., health care workers or family of immunocompromised persons)
 - Persons at risk for VZV exposure
 - Live or work where transmission is likely (e.g., teachers, day care staff, institutional settings),
 - Live or work where transmission can occur (e.g., college students, inmates and staff at correctional institutions, military personnel),
 - Nonpregnant women of childbearing age,
 - Adolescents and adults living with children, and
 - International travelers.

Breakthrough varicella

Although varicella vaccine is 80-90% efficacious in preventing infection, about 1% of vaccinees per year develop breakthrough disease.³ Breakthrough varicella is usually a mild afebrile illness, with less than 50 maculopapular or vesicular lesions. Although mild, this form of varicella is infectious.

Varicella outbreak prevention and control

Pre-exposure immunization: In 2001, the Alaska Department of Education and Early Development added varicella vaccine as a required immunization for all licensed child care facilities.

Post-exposure immunization: The ACIP recommends vaccinating all susceptible persons within 3 to 5 days after exposure to a varicella case. The Alaska Immunization Program provides vaccine for children 12 months to 18 years of age, however there are no public health resources for adult varicella vaccination at this time.

Notification of outbreak: Child care centers and schools should notify staff and parents when a case of varicella occurs to allow rapid implementation control measures. Children with varicella should be excluded from school or child care until all lesions have formed crusts. Public Health can assist in developing and distributing educational materials for staff and parents.

Varicella zoster immune globulin (VZIG): Susceptible persons who are at risk for severe complications from varicella may benefit from VZIG, including immunocompromised persons, premature infants <28 weeks' gestation, infants whose mothers develop varicella shortly before delivery, and pregnant women. VZIG can be obtained through FFF Enterprises (41093 County Center, Temecula, CA 92591) at 800-843-7477. *VZIG is not provided by the Alaska Immunization Program.*

Recommendations for child care facilities and schools:

1. Maintain up-to-date immunization records for each child at child care centers. (Varicella vaccination is not required for school attendance, grades K-12, at this time.)
2. Exclude children with varicella from child care centers and schools until all lesions have crusted over.
3. Notify parents and other personnel immediately if varicella occurs at a child care facility or school.
4. Review the varicella history for all child care staff. If the status is uncertain, these individuals should receive varicella vaccine or a varicella antibody titer.

Recommendations for health care providers:

5. Consider varicella vaccine for susceptible persons exposed to varicella if they are within 3-5 days of exposure.
6. Administer varicella zoster immune globulin (VZIG) to susceptible high risk contacts within 96 hours of exposure.
7. Report outbreaks of varicella to the Section of Epidemiology, particularly if transmission may occur to people at risk for serious complications to varicella.

References

1. CDC. Prevention of Varicella: Recommendations of the ACIP. *MMWR* 1996;45(RR11): 1-25.
2. CDC. Prevention of Varicella Updated Recommendations of the ACIP. *MMWR* 1999;78(RR06):1-5.
3. CDC. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Atkinson W, Hamborsky J, Wolfe S, eds. 8th ed. Washington DC: Public Health Foundation, 2004.

* Susceptible = no reliable history of varicella disease, evidence of serologic immunity, or history of varicella vaccination.