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Suspected Measles Case in Alaska — January 2015

Background

Measles is a highly contagious respiratory disease characterized by a prodrome of fever, cough, coryza, and conjunctivitis, followed by a diffuse maculopapular rash that appears 2–4 days after symptom onset and persists for 5–6 days.¹ The rash characteristically begins at the hairline, and then descends to involve the face and upper neck. During the next 3 days, the rash gradually proceeds downward and outward, reaching the hands and feet. About 30% of persons infected develop complications, ranging from mild to severe (e.g., ear infections, diarrhea, pneumonia, and encephalitis).¹ Globally, measles caused nearly 150,000 deaths in 2013.²

Measles virus can be transmitted from 4 days before to 4 days after onset of the rash via airborne droplets through coughing and sneezing, and infects up to 90% of susceptible persons exposed. The incubation period is 7–21 days.³

Live, attenuated measles vaccine is safe, well tolerated, and effective at preventing disease—one dose of the vaccine is approximately 95% effective, and two doses are roughly 98% effective.³ Following measles vaccine introduction in the United States, case counts fell from an estimated 3–4 million cases annually to a declaration of measles elimination in 2000.^{3,4} However, high vaccine coverage is needed to prevent outbreaks.⁵ Imported cases of measles have since continued to occur, occasionally leading to large outbreaks that are primarily fueled by unvaccinated persons.⁶ The recent measles outbreak linked to the Disneyland resort is one such example.⁷

Case Investigation

On January 20, an Anchorage pediatrician contacted the Alaska Section of Epidemiology (SOE) to report a suspected case of measles. A previously healthy 1-year-old child visited California (initially reported as the ‘Disneyland area’) between December 31 and January 12, and received well-child vaccinations (measles-mumps-rubella [MMR], hepatitis A, and varicella) after returning to Anchorage on January 13. The child developed a fever of 102.4°F and coryza on January 15, followed by a localized rash on the right thigh and buttock on January 16. Initial bloodwork was drawn on January 19. The provider notified SOE of a possible case of measles on the afternoon of January 20. SOE staff determined that measles infection was unlikely, due to the atypical clinical presentation and recent vaccination, which could account for the described symptoms. However, due to the reported travel to an area with current measles activity (subsequently found to not include the Disneyland area), instructions for obtaining appropriate specimens for measles testing, including a nasopharyngeal swab for measles polymerase chain reaction (PCR) and serum for serology, were given. On January 23, SOE was notified of a negative measles IgM, but positive measles IgG and PCR.

On January 23, after consultation with the Centers for Disease Control and Prevention (CDC) and the California Department of Health, and upon further discussions with the family (which helped provide an accurate travel history and better characterize the patient’s symptom progression), SOE staff considered the likelihood of this case representing a true measles infection to be very low. Rather, it was felt that the PCR test was picking up the vaccine strain of the virus, as has been documented to occur.⁸ Genotype testing was undertaken to determine if the strain detected was a vaccine or wild type. While awaiting the genotype test results, out of an abundance of caution, SOE offered post-exposure prophylaxis to high-risk contacts (i.e., infants, non-immune pregnant women, immunocompromised persons) that were still within the window of opportunity to receive immune globulin (IG).

Three such persons (all infants) received IG prophylaxis. On January 28, the genotype results came back positive for the vaccine strain of measles.

Box. Measles Vaccine Recommendations⁴

- The 1st MMR dose is recommended at 12–15 months of age.
- The 2nd MMR dose is recommended at 4–6 years of age (valid if given ≥28 days after the 1st dose).
- Adults born during or after 1957 who do not have evidence of immunity against measles should get at least one dose of MMR vaccine.
- Non-immune adults who are going to be in a setting that poses a high risk for measles transmission—including students at post-high school education institutions, health care personnel, and international travelers—should have two doses of measles vaccine separated by at least 28 days.

Discussion

This report highlights some of the challenges involved in diagnosing measles, a disease now uncommon in the United States, but whose numbers are increasing. Some U.S. primary care providers may have never seen a case of measles, and should ensure that they are familiar with its clinical presentation. Early public health involvement in working up a suspected case of measles is critical to ensure appropriate laboratory testing, to assist with interpretation of test results, and to minimize secondary spread to others in the community. As was demonstrated here, recent MMR vaccination can make interpreting laboratory results challenging. In this case, genotyping confirmed that the positive PCR result was due to the vaccine strain of the virus; the positive IgG result might have reflected lingering maternal antibodies, immune response to the vaccine (which seems less likely given the timing and negative IgM), or a false-positive test.

Recommendations

1. Health care providers should ensure that all of their patients are age-appropriately vaccinated against measles. Since measles is so contagious, a high vaccine coverage rate in communities is needed to protect the public’s health (Box).⁵
2. Health care providers should **immediately notify SOE** if they suspect a case of measles; call 907-269-8000 during work hours or 800-478-0084 after-hours. Contact SOE for assistance in obtaining PCR testing for all suspected cases.
3. Parents should be instructed to keep children with confirmed or suspected measles infection at home and avoid contact with others for 4 days after rash onset.
4. More information can be found on the SOE measles website: <http://www.epi.alaska.gov/id/measles>

References

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