

Unprotected People #73

Varicella

CDC Provides Case Reports on Varicella-Related Deaths of Three Susceptible, Unvaccinated Children

In an article published in MMWR on March 25, 2005, CDC stated it had received reports about eight varicella-related deaths during January 2003–June 2004. The article contained case reports on three of the eight. The three were healthy, unvaccinated, susceptible children ages 14 months, 10 years, and 12 years. The article's Editorial Note underscored the importance of making sure that children are vaccinated at the earliest recommended age (12 months) and that older children receive catch-up vaccination at their next office visit. To prevent cases and deaths in older children and adolescents, states that do not have a policy in place should consider requiring evidence of varicella immunity for children entering middle and high school.

The article is reprinted below in its entirety, excluding references. Titled "Varicella-Related Deaths—United States, January 2003–June 2004," it is based on reports from the Maricopa County Department of Public Health, Phoenix; Arizona Department of Health Services; Arkansas Department of Health; New York City Department of Health and Mental Hygiene; and Epidemiology and Surveillance Division, NIP/CDC.

Varicella-Related Deaths—United States, January 2003–June 2004

During 2003 and the first half of 2004, CDC received reports of eight varicella-related deaths. The age of the decedents ranged from 1 to 40 years. Six of the eight deaths occurred among children and adolescents aged <20 years. The cases were reported from Arizona (two), Maryland (two), Arkansas (one), New Hampshire (one), Ohio (one), and New York City (one). Six deaths occurred in unvaccinated persons. Vaccination status of the remaining two persons could not be determined. This report describes clinical data for three of the

fatal varicella cases in children, reported from Arizona, Arkansas, and New York City; all three patients were susceptible and unvaccinated, but otherwise healthy. The three other children and adolescents, not described in detail in this report, were immunocompromised as a result of at least one preexisting condition. The findings in this report underscore (1) the importance of timely routine vaccination of children aged 12–18 months and catch-up vaccination of older susceptible children and adolescents according to current recommendations and (2) the need for timely and complete national varicella death surveillance.

Case Reports

Case #1

In October 2003, an unvaccinated male aged 12 years with no history of varicella disease had a rash consistent with varicella. Approximately 2 weeks before, he had been exposed to an unvaccinated classmate with varicella. Three days later, the child was taken to an emergency department (ED) because of repetitive episodes of vomiting, shortness of breath, and weakness. On examination, the patient was afebrile, and his pulse oximetry was initially 97%. However, after he was admitted to a room, his pulse oximetry decreased to 69%. He was placed immediately on a nonrebreather mask and, subsequently, his pulse oximetry increased to 99%. In addition, he had numerous purple-tinged, vesiculopustular lesions in various stages of development, consistent with varicella with hemorrhagic complications. A chest radiograph revealed that his lungs were clear. Intravenous (IV) fluids were started, but he soon had a seizure and became apneic. Cardiopulmonary resuscitation was started, but the child died on the second hospital

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day. Viral cultures and varicella laboratory testing were not conducted. An autopsy was not performed. Diagnosis was based on clinical description and history of exposure.

Case #2

In January 2004, an unvaccinated female aged 10 years with no history of varicella disease had a rash on her abdomen, chest, and back, consistent with varicella. The child had been exposed to several classmates with varicella. Ten days later, she was taken to an ED because of ataxia and changes in mental status. On examination, she had a fever of 103.1 degrees F (39.5 degrees C), and her neurologic assessment revealed a Glasgow coma score of 9/15. Her eyes opened spontaneously; she was reactive to pain, but could not talk. IV acyclovir, ceftriaxone, vancomycin, and immunoglobulin were started. The patient experienced respiratory failure; she was intubated and transferred to a children's hospital for continued management.

On the third day of hospitalization, her mental status deteriorated. She had no withdrawal to pain or deep tendon reflex, did not blink eyes on command, and began to experience seizures. On the fourth hospital day, the patient had brain death diagnosed on clinical examination; she was pronounced dead on the following day. Laboratory results were positive for varicella zoster virus infection with both IgM assay and polymerase chain reaction. Blood cultures for bacterial agents were negative. An autopsy was not performed.

Case #3

In March 2004, an unvaccinated female aged 14 months with no history of varicella disease had a rash on her face and back, which eventually spread to her abdomen and chest. The source of exposure could not be identified. Three days later, she had vomiting, diarrhea, and reduced oral intake. Two days later, she was taken to an ED because she became cold to touch and too weak to walk. At the ED, she had fever of 102.0 degrees F (38.9 degrees C) and was hypotensive, with a blood pressure of 54/44. Varicella and septic shock were diagnosed. She received fluid resuscitation, IV ceftriaxone and vancomycin, and acetaminophen for fever control.

She was transferred to a children's hospital, where her condition deteriorated. Despite aggressive treatment, she had respiratory and cardiac arrest and died less than 1 hour after arriving at the hospital. Blood cultures for bacterial agents were negative. Further serologic tests, chest radiograph, and an autopsy were not performed. Diagnosis was based on the clinical description of the case.

Editorial Note

The three cases described in this report demonstrate that varicella can be fatal and that some deaths among healthy children continue to occur despite availability of a safe and effective varicella vaccine. Varicella vaccination is >95% effective against severe disease and, since 1996, has been recommended for routine administration to children aged 12-18 months and to all susceptible persons aged \geq 13 years.

For children aged 19–35 months, national estimates of varicella vaccination coverage increased from 26% in 1997 to 85% in 2003. With the increase in vaccine uptake, substantial reductions in varicella morbidity and mortality have occurred. In the two Varicella Active Surveillance Project (VASP) sites (Antelope Valley, California, and West Philadelphia, Pennsylvania) during 1995-2003, the number of reported varicella cases declined by approximately 85%, and varicella hospitalization rates declined by approximately 70%. In Illinois and Michigan, two states with passive surveillance and annual varicella reporting to CDC, the average number of reported varicella cases had declined 87% in both states in 2003 (3,823 cases in Illinois and 4,171 cases in Michigan), from the average incidence in those states during 1993-1995 (28,378 average number of cases in Illinois and 33,177 average number of cases in Michigan). On the basis of reports received by CDC's National Center for Health Statistics (NCHS), varicella deaths declined 78% for all age groups during 1999-2001 (N=118), compared with 1990-1994 (N=525).

Some providers might consider delaying vaccination until age \geq 15 months on the basis of publications

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suggesting lower vaccine effectiveness among children vaccinated before that age. However, this has not been a consistent finding; other studies have not indicated age at vaccination as a risk factor for vaccine failure. As exemplified in the death of the child aged 14 months, timely vaccination is important, and vaccination should not be delayed.

In addition to routine vaccination of young children, in 1999, the Advisory Committee on Immunization Practices recommended implementing requirements for childcare and school entry to help ensure that children do not reach adolescence or adulthood without varicella immunity. By June 2004, a total of 44 states had implemented elementary school or childcare entry requirements for varicella vaccination. However, these measures alone are not sufficient. Middle- or high-school entry requirements are needed to cover cohorts of children enrolled in school before implementation of the childcare and elementary school requirements. As of March 23, 2005, only 18 states had included middle- or high-school entry requirements for varicella vaccination. One death (case 2) described in this report occurred in a state with elementary school and childcare requirements, but no middle- or high-school entry requirements. To prevent cases and deaths in older children and adolescents, states that do not have a policy in place should consider requiring evidence of varicella immunity for children entering middle and high school.

In 1999, the Council of State and Territorial Epidemiologists (CSTE) required states to report varicella-related deaths to CDC's National Immunization Program (NIP). During 1999–2001, a total of 27 varicella-related deaths were reported to NIP, compared with 118 reported to NCHS. Completeness of reporting of varicella deaths to CDC needs to be improved. However, important detailed case investigation information such as history of disease, potential risk factors, and laboratory test results are supplied by the death reports submitted to NIP. Continued and improved surveillance of varicella deaths will help to monitor the vaccination program.

Despite 85% national coverage, varicella vaccination coverage rates vary by state. In 2003, vaccination coverage in states among children aged 19–35 months ranged from 67% to 93%, with 28 states reporting vaccination coverage levels <85%. Families and healthcare providers of all children are advised to ensure vaccination of children who do not have reliable history of varicella disease. Continued public health efforts in implementation of routine and catch-up vaccination will ensure that children are protected from disease during childhood and do not enter adulthood without immunity, when disease is more severe and the risk for death is greater.