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Measles on the Rise: Academic Institutions be Prepared

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Abstract

Measles is a highly contagious, acute viral illness that can lead to serious complications and death. From January 1 through May 20, 2011, a total of 118 measles cases were reported from 23 states and New York City, the highest reported number for the same period since 1996. Patients ranged in age from 3 months to 68 years. Of the 118 cases, 105 unvaccinated persons were associated with importation from other countries. Transmission occurred in households, child care centers, shelters, schools, emergency departments, and at a large community event. It is important for those in academic institutions to understand measles and be prepared to deal with these kinds of diseases. Recommendations for preventing further measles transmissions include reminding health care providers to consider a diagnosis of measles in ill persons who have traveled overseas, to use infection control practices to prevent transmission in health-care and other group settings, and to promote high coverage with measles, mumps, and rubella (MMR) vaccine for children as well as adult vaccination.

Measles is a highly infectious, acute viral illness characterized by fever, rash, cough, conjunctivitis, and coryza and can lead to encephalitis, pneumonia and death (Mancuso, 2008). Because of successful implementation of measles vaccination programs, endemic measles transmission has been eliminated in the United States and the rest of the Americas. However, measles continues to occur in other regions of the world, including Europe (Centers for Disease Control and Prevention, 2008). Academic institutions, from preschool to higher education, are likely places exposure or transmission of this illness would occur. Educators should be aware of the signs and symptoms of infection in order to break the cycle.

During the period January 1 through May 20, 2011, a total of 118 cases were reported from 23 states and New York City, the highest reported number for the same

period since 1996. Patients ranged from age 3 months to 68 years. Of the 118 cases, 105 were associated with importation from other countries and were unvaccinated (Centers for Disease Control and Prevention, 2011b). On June 15th, *USA TODAY* reported there have been at least 152 cases of measles diagnosed in the United States this year, according to the Centers for Disease Control and Prevention (CDC), this is twice the number seen in a typical year and the biggest outbreak in 15 years (Szabo, 2011). The *Measles/Rubella Weekly* bulletin dated October 29, 2011 reported 219 measles cases confirmed in the United States and 4 rubella cases confirmed for the period of weeks 1- 43, 2011.

Measles Outbreaks in Europe and the United Kingdom

Measles were considered eliminated from England after the implementation of

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the schools' vaccination campaign in 1994. A research study in England revealed MMR coverage in two-year-old children has decreased by more than 10% since 1995. About 1.9 million school children and 800,000 pre-school children were recorded as incompletely vaccinated against measles. Based upon this, approximately 1.3 million children age 2-17 years were susceptible to measles. Due to the inconsistency of school-age vaccinations, the potential exists for an outbreak (Chor, Gay, Faser, & Ramsey, 2008).

In the United Kingdom in June of 2008, the Health Protection Agency announced that measles had again become endemic in Wales and England due to declining vaccination coverage (Inpharma, 2008); consequently, the incidence of this disease is rising with localized outbreaks in unvaccinated children and adults. In one case, a 28-year-old female was misdiagnosed resulting in hospitalization and near death. Although, the presentation of measles in this patient was unique and atypical, measles must be considered as a differential diagnosis in patients with fever and rash (Chatterjee, Coleman, Brook, & McCrea, 2010).

Measles Facts

When a person with measles coughs, sneezes, or talks, infected droplets spray into the air where other people can inhale them. The infected droplets remain active and contagious for up to two hours after landing on a surface. A person can contract the disease by touching an infected object or surface. A nonwashed hand placed directly in the eye or mouth would be enough to transfer the measles from one person or object to another. The highly contagious virus is a concern in community settings such as schools, airplanes, shelters, and any close community setting. Factors that would increase the risk of contracting the

disease include not receiving the vaccine, international travel, and those with a vitamin A deficiency (Mayo Clinic Staff, 2011).

Signs and symptoms of measles appear 7 to 14 days after exposure to the virus. The symptoms include fever, dry cough, sore throat, runny nose, inflamed eyes, tiny white spots with bluish-white centers found inside the mouth on the inner lining of the cheek (Koplik's spots), and a skin rash made up of large, flat blotches that often flow into one another. The infection occurs in sequential stages over a period of two to three weeks. The first stage, infection and incubation, occurs for the first 7 to 14 days after one is infected. During this period, one may show no signs of the measles. In the second stage of measles, a person will have a high fever and a rash that may begin on the face or along the hairline. Over the next few days, the rash will spread down the arms and the trunk, over the thighs, and down the legs, and to the feet. The rash then begins to recede, fading first from the face and last the legs. The third stage is the communicable period, which lasts approximately eight days, starting four days before the rash and ending when the rash has been present for four days (Mayo Clinic Staff, 2011). Teachers need to be aware of these signs and symptoms as a teacher may be the first line of defense against the spread of this illness.

Complications from measles could include ear infections, bronchitis or croup, pneumonia, encephalitis, pregnancy problems, and low platelet count. Pregnant women therefore need to take special care to avoid measles, because the disease can cause pregnancy loss, preterm labor, or low birth weight. No treatment can cure a measles infection; however, there are medications such as fever reducers, antibiotics, and Vitamin A to help ease the discomfort and reduce the incidence of other infection. Other home comfort measures

are rest, fluids, humidifier, and low lights to rest the eyes.

Vulnerable individuals including infants, those born after 1957, and those not previously immunized should be given a post exposure vaccination within 72 hours of exposure. People with weakened immune systems and pregnant women who are exposed to the virus may receive an injection of immune serum globulin. When given within six days of exposure to the virus, these antibodies can prevent measles or make symptoms less severe (Mayo Clinic Staff, 2011). Once a suspected measles case has been identified, prompt isolation of the potentially infectious patient and implementation of appropriate infection-control measures can help to decrease risk for transmission (Centers for Disease Control and Prevention, 2008).

Spread of Measles

Measles can be severe and is highly infectious; following exposure, up to 90% of susceptible persons develop measles. Children and adults who remain unvaccinated and develop measles also put others in the community at risk. For infants too young for routine vaccination and persons with medical conditions that contraindicate measles immunization, the risk for measles complications is particularly high. Susceptible persons depend on high MMR vaccination coverage among those around them within the community to protect them from exposure. This is referred to as “herd” immunity (Centers for Disease Control and Prevention, 2011b). The possibility that increasing rates of intentional undervaccination could lead to a rise in outbreaks of vaccine-preventable diseases is a monumental concern, according to Anne Gershon, MD, a pediatric infectious disease expert at Columbia University Medical Center in New York City (Neale, 2010).

Although the rate of two-dose immunization against measles was 95% in the San Diego area, a single case of measles from a seven year-old returning from overseas sparked an outbreak that exposed 839 people and sickened 11 other children in 2008. None of the 12 children, who ranged in age from 10 months to nine years, had been vaccinated. A vigorous public health response, including quarantine of exposed children who had not been vaccinated, prevented the outbreak from progressing further. In the San Diego area, parents who refused vaccines for their children generally were white, well educated, and from the middle and upper classes. There were clusters of vaccine refusal, occurring more often in public charter and private schools, as well as in public schools in upper class areas. Although high vaccination rates prevented the San Diego measles outbreak from extending into the general population, one cannot rely upon herd immunity to protect each and every child (Neale, 2010).

Landon Lewis, four years old, was living in a Minneapolis homeless shelter when he fell ill, first with a fever of 104 degrees, then with a red rash on his forehead. It took two visits for a doctor to diagnose measles, a disease clinic staff had not seen in years. After the rash spread into the child’s mouth and throat, swallowing became difficult. Landon began vomiting, developed a cough, nearly choked, and was rushed to the emergency room and resulted in hospitalization for five days. For the doctors and nurses caring for patients like Landon, the return of vaccine-preventable diseases such as measles that once killed 3,000 to 5,000 Americans a year is both frightening and all too predictable (Szabo, 2011).

In the past three years, doctors also have seen outbreaks of other vaccine-preventable diseases, such as mumps, whooping cough, and a life-threatening bacterial infection

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called Hib. All can be deadly (Szabo, 2011). Parents who decline vaccines may not realize the risk being placed on all children and adults within the community (Szabo, 2011).

A multi-site study of 351 children, using data from 10 cities across the United States, was conducted as part of a larger project within the Collaborative Program for Excellence in Autism (CPEA) to address the question: Is regression in Autism Spectrum Disorder (ASD) associated with the MMR vaccine? There was no evidence that onset of autistic symptoms or regression was related to the MMR vaccine. Other research also supports this evidence. Chen, Landau, Sham, and Fombonne (2004) examined the association between the prevalence of autism and exposure to measles infection and the MMR vaccine in the UK and found no evidence for such a relationship. Wilson, Mills, Ross, McGowan, and Jadad (2003) reviewed four studies on the relationship between ASD and the MMR vaccine, none of which found any evidence for a link (Richler, et al. 2006).

Prevention Measures

The vaccines available in the United States are the MMR and the measles-mumps-rubella-varicella (MMRV) vaccines. The first dose of measles vaccine is routinely advised at age 12-15 months in the United States. However, children traveling outside the United States are recommended to get the vaccine starting at age six months. If the child is age 6-11 months and will be traveling internationally, consult a doctor about getting the measles vaccine (Centers for Disease Control and Prevention, 2011a). Travelers to Europe, Africa, and Asia have been sources of imported cases in the United States. Particular hotspots may come and go, but all travelers should protect themselves by being vaccinated (Centers for Disease Control and Prevention, 2011a).

Children 12 months or older, adolescents, and adults who are traveling outside the United States may be considered immune if they have received two doses of MMR or if they have had the diagnosis of measles documented by a physician, have laboratory evidence of immunity, or were born before 1957. If the person does not meet these criteria, he or she should receive two doses of measles-containing vaccine separated by at least 28 days. Maintaining high immunization rates with MMR vaccine is the cornerstone of outbreak prevention (Centers for Disease Control and Prevention, 2011b).

The best way to help inform parents about the importance of vaccination for their children remains the dissemination of science-based information through the media and doctors. A longer-range solution would be to make sure school health curricula contain lessons on vaccines and the diseases they prevent (Neale, 2010). Measles transmission in schools was common in the era before the interruption of endemic-disease transmission, and school requirements for vaccination have been a successful strategy for achieving high vaccination coverage levels in this age group and decreasing transmission in school settings. In the United States, all states require children to be vaccinated in accordance with Advisory Committee on Immunization Practices recommendations before attending school. However, medical exemptions to immunization requirements for day care and school attendance are available in all states; in addition, 48 states offer nonmedical religious exemptions, and 21 states offer nonmedical exemptions requiring only a parental affidavit. Compared with vaccinated persons, those exempt from vaccination are 22 to 224 times more likely to contract measles (Centers for Disease Control and Prevention, 2008).

Parents play a primary role in the health and health education of their children. Parents serve as their children's main educator on health issues, but where can they get accurate health information? To help guide local Parent Teacher Associations (PTA) in their programmatic efforts, the National PTA maintains positions and policy statements on multiple health issues including immunizations. Likewise, the school-health partnership is key to promoting the health of children and adolescents. Comprehensive school health programs and integrated services are necessary to support parent and community efforts to promote adolescent and child health issues, including immunization programs (Soldano & Markell, n.d.).

Teachers are at risk of becoming victims of increasingly large measles outbreaks. This is why it is very important that all teachers and female teachers in the childbearing years be vaccinated (Maddern, 2009). Measles is a very dangerous infectious disease that can cause illness, disability, and death. Public health officials, physicians, parents, schools, and other congregate groups should encourage and promote vaccination and be aware of protection and prevention measures.

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