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Adult Measles in a Traveller: Infection Control Implications of Instituting Proper Precautions

To the Editor—Recently, an overseas adult traveller was admitted to our hospital with rash and fever. His case illustrated the difficulties encountered in the differential diagnosis of measles in adult travellers and the importance of placing hospitalized patients under proper precautions.[1-5] The traveller was a 30-year-old male mechanical engineer from France who visited family and friends in the United States. Days after his arrival, he became ill with fever, rash, and cough and was admitted to the hospital. His rash began on the face and both wrists. Subsequently, the rash spread to his trunk and extremities, including the palms and soles. The patient had conjunctival suffusion and later developed aphthous ulcers. He denied recent contact with sick individuals and stated that he had completed his childhood vaccinations. The infectious disease consultant performed a differential diagnosis that included Mediterranean spotted fever (MSF), Coxsackie infection, scarlet fever, leptospirosis, adenovirus, and measles. The dermatology consultant thought that the most likely diagnosis was either scarlet fever or viral exanthem. Although measles was included in the differential diagnosis, it was thought to be unlikely because the patient's rash was atypical (eg, was found on the palms and soles) and because of the patient's history of childhood vaccinations. The patient was placed under droplet precautions and empirically treated with doxycycline because of the possibility of MSF, and serum specimens were tested for all of the infectious diseases included in the differential diagnosis. On hospital-day 4, the patient's measles immunoglobulin (Ig) G titer was reported as undetectable. Being nonimmune to measles increased the possibility that the patient had measles, and the patient was placed under airborne precautions.[6-10] Measles is a highly contagious viral infection that primarily affects children but also occurs in nonimmunized or partially immunized adults. In adults, measles may be more severe than in children, and the diagnosis may be difficult if the presentation is atypical or does not occur during a measles outbreak. Measles virus is transmitted through the air, and hospitalized patients require airborne precautions.[1-5] Most patients with measles are thought to be infectious from 4 days prior to the appearance of the rash through 4 days after the rash has appeared. The incubation period for measles is 8–12 days.

Before being placed under airborne precautions, the patient with measles potentially exposed a large number of individuals (eg, ambulance personnel, healthcare workers [HCWs], other patients, and visitors and family members) in the emergency department and hospital. These potential hospital exposures had important employee health and public health implications that necessitated a comprehensive contact investigation. Before airborne precautions were instituted, a contact investigation determined that 205 HCWs were potentially exposed to measles. There were also 254 potential measles exposures involving patients and visitors in the emergency department and hospital. Those not immunized against measles may be given measles vaccine within 3 days after exposure. At the time that measles was diagnosed in this case, the window of opportunity for measles vaccination had passed. Administration of Ig can achieve passive immunity against measles in nonimmune individuals; the Ig should be administered within 6 days after exposure.

During the contact investigation, individuals were considered to have immunity to measles if they were born before 1957, had 2 documented measles vaccinations, or had measles diagnosed by a physician. As a condition of employment, all of our hospital personnel must demonstrate evidence of immunity against measles. For HCWs, proof of immunity is acceptable if HCWs received 2 or more measles vaccinations and have a negative measles IgG titer. All of our 7,000 HCWs met these criteria and were considered to be immune to measles. Of the 7,000 HCWs, 4 had received 2 doses of measles vaccine and had undetectable measles IgG titers. These 4 HCWs were offered passive immunity with Ig, but none elected to receive Ig. Of the 254 patients and visitors potentially exposed to measles, 3 had no measles immunity or questionable measles immunity, and they were offered and received Ig. The contact investigation involved 459 potential measles exposures. A contact list was maintained regarding

potentially exposed HCWs, patients, families, and visitors. These individuals were advised of the clinical manifestations of measles and were requested to report any signs of measles immediately to their healthcare provider. There were no secondary cases of measles from this extensive exposure. At the time, it was not known that there was an ongoing measles outbreak in France.

This case has important infection control implications. The most important epidemiologic lesson to be learned from this case is that, in hospitalized patients, precautions should be based on the most contagious infectious disease being considered in the differential diagnosis (eg, measles), even if it is not the most likely diagnosis. Among the infectious diseases that were considered in the differential diagnosis in this case, only measles required airborne isolation. The other diagnostic possibilities required either no precautions or droplet precautions. By not placing the patient under airborne precautions for possible measles at hospital admission, an extensive contact investigation was necessary involving HCWs, patients, families, and hospital visitors during the exposure period. The extensive contact investigation was performed in concert with local and state health authorities. The contact investigation involving airport and aircraft personnel and passengers was performed by the Centers for Disease Control and Prevention.

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