CORRESPONDENCE

The First Case of Ebola Virus Disease Acquired outside Africa

TO THE EDITOR: The current epidemic of Ebola virus disease (EVD) remains essentially confined to West Africa.[1] We present a case of transmission of the virus associated with the care of a patient who was transported from Sierra Leone to Spain on September 22, 2014.

A 44-year-old female nurse assistant took care of the patient on one occasion on September 24, and after he died on September 25, she helped with burial of the body (Table 1).[2,3] She had not traveled outside Spain or had any other recognizable potential exposure to the Ebola virus. On September 30, malaise and a low-grade fever (body temperature, <38°C) developed. The low-grade fever continued for 3 days, and her temperature increased to 38°C in the following 3 days.

On October 6, increased weakness, myalgia, nausea, mild cough, and a maculopapular rash affecting the arms and trunk developed, and she presented to our emergency department reporting that she had had contact with an Ebola patient. She was immediately transferred to an isolation room (Table 1).

On admission at 7 a.m., she had a temperature of 36.7°C, blood pressure of 90/60 mm Hg, 95% oxygen saturation measured by means of pulse oximetry, and a maculopapular rash. She reported that she had not received antipyretic agents. At 11 a.m., watery, nonbloody diarrhea and diminished alertness developed. By 2 p.m., she had had three stools of watery diarrhea and had a slightly productive cough, progression of the rash, and hypotension (blood pressure, 80/40 mm Hg) in spite of the receipt of intravenous fluids (500 ml of isotonic saline during the first hour after admission and an additional 500 ml during the next 4 hours). Her body temperature remained below 38°C.

A quantitative polymerase-chain-reaction test for Ebola virus was reported as positive and confirmed at 6:30 p.m. A transfer to a designated hospital for the care of patients with EVD was

Table 1. Protective Measures Used in Caring for a Patient from Sierra Leone with Ebola Virus Disease (EVD) and for the Nurse Assistant Infected after Exposure to the Patient in Spain.*

Personal protective equipment used by the nurse assistant at the time of exposure to the patient from West Africa with confirmed EVD†
Surgical mask
Double layer of gloves
Disposable gown
Waterproof long-sleeved clothing covering the feet
Waterproof footwear, hood, face mask, and goggles
FFP3 respirator mask against possible exposure to respiratory droplets
Personal protective equipment and measures used in the care of the nurse assistant in whom EVD developed after exposure to the patient from West Africa
During transfer of the patient to the isolation room in a wheelchair and recording of case history
Surgical mask
Double layer of gloves
Disposable gown
During the initial evaluation
Surgical mask
Double layer of gloves
Waterproof long-sleeved clothing covering the feet
Waterproof footwear
During subsequent care (after development of productive cough and diarrhea)
Double layer of gloves
Disposable gown
Waterproof long-sleeved clothing covering the feet
Waterproof footwear and hood
FFP3 respirator mask
Goggles
During both the initial evaluation and subsequent care
The patient used an individual toilet within the isolation room that was cleaned with bleach after use.
Vomit was handled with kidney-shaped emesis pans.
Excreted fluids and all material that was in contact with the patient were disposed of in rigid sealed biosecurity containers.

* FFP3 denotes filtering facepiece, class 3. FFP3 masks filter at least 99.95% of airborne particles measuring 1 to 5 μm (98% of airborne particles measuring 0.6 μm).

† The first contact with the patient from West Africa involved helping in the removal of clothes and absorbent pads. The second contact involved assisting with burial of the patient's body and removal of infected material. Measures listed are consistent with those in the protocol of the Spanish Ministry of Health; no breach of the protocol was reported.

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arranged. The nurse assistant's clinical situation continued to deteriorate over a period of 10 hours, with a temperature up to 38°C, continuing diarrhea (8 to 10 stools), vomiting, productive cough, extension of the rash, and hypotension (blood pressure, 90/40 mm Hg) that was managed with intravenous fluids (up to 2 liters of isotonic saline over a period of 4 hours, supplemented by potassium chloride). At the time of transfer to the designated hospital after midnight, a temperature of 38°C developed despite the use of intravenous acetaminophen (paracetamol). The nurse assistant has subsequently recovered and was discharged from the hospital on November 5.

Signs of infection have not developed in any of the eight health care workers who were in contact with this nurse assistant, and all have passed the 21-day incubation period after exposure. No other secondary cases of EVD have been reported in Spain as of this writing.

This case shows that initial symptoms of EVD can evolve in patients who have a low-grade fever, a scenario that has also been reported in a patient with EVD in the United States.[4] An appropriate clinical evaluation of patients who have had high-risk exposure to the Ebola virus should be performed, with an understanding that exposure may have occurred outside the geographic areas where EVD is prevalent.[5]

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Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

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