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Enterovirus D68 nosocomial outbreak in elderly people, France, 2014

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Sir,

In the context of the re-emergence of enterovirus D68 (EV-D68) infection, the main concern is to understand its full epidemiology spectrum [1]. In this letter, we report for the first time an outbreak of nosocomial respiratory infections in elderly people due to EV-D68. These new data are of prime importance to further detect and manage such nosocomial infections.

On 21 October 2014, an ongoing respiratory outbreak in the Alzheimer disease unit of a nursing home was reported to the National Reference Centre for influenza viruses (Bron, France). Thirteen patients were present in the Alzheimer disease unit at the time of the epidemic and all had an individual bedroom. The mean age was 89 years (range 79–101 years); eight of the 13 patients had an underlying disease: one had chronic obstructive pulmonary disease and seven had cardiovascular disease. Of the 13 patients, seven required help to move and six were bedridden. Interactions between patients occurred only in the living room, where each patient had a predefined seat. Bedridden patients spent the shortest time in the living room because it was strictly limited to lunch time. The other patients could carry out other activities in the living room besides eating lunch. Hence there was prolonged contact in the living room mainly for these patients.

On 20 October (Day 1 (D1)), four patients developed signs of upper respiratory tract infection (cough and rhinorrhoea without fever). The next day (D2), three new patients developed similar clinical signs. On 23 October (D4), nasal swabs were collected from these three most recently symptomatic patients, as recommended by the French guidelines for epidemic management in nursing homes [2] and sent to our laboratory. During the evening, medical staff noticed that an additional patient was starting to cough. All the patients developed only mild respiratory symptoms, no complications were described. There were no further reported cases among other patients of the nursing home or among the medical staff.

Virus RNA extraction from nasal samples was performed using the NucliSens Easy Mag instrument (BioMérieux, Lyon, France). Real-time PCR was then used for the detection of influenza A and B viruses, respiratory syncytial virus, human metapneumovirus, adenoviruses A to F, coronavirus E223 and OC43, bocavirus, parainfluenzaviruses 1 to 4 and rhinovirus/enterovirus. Samples from two of the patients tested positive with a commercial real-time PCR (MWS r-geneTM respiratory panel; BioMérieux) that detects both rhinovirus and enterovirus and negative with other PCRs. The sample from the third patient was negative for all PCRs. The two positive samples were next transferred to the National Reference Centre for Enteroviruses for further characterization. EV-D68 infection was confirmed for the two patients by a recently implemented specific real-time RT-PCR [3]. Sequencing of the complete VP1 of the two EV-68-positive specimens was performed. The two sequences were 100% identical, belonged to clade B, and were similar to those viruses currently circulating in the USA and France [4] (Fig. 1).

Three days after the first cases occurred in the Alzheimer disease unit, the medical staff implemented droplet precautions. These consisted of wearing facemasks for the staff, restricting access to visitors in the unit and reinforcing hand hygiene using hydro-alcoholic solution. The symptomatic patients were isolated in their bedrooms, and the living room was closed. These infection control measures were stopped 8 days after the last patients developed their clinical signs.

In this report, we describe an EV-D68 outbreak in elderly people. We identified two confirmed cases (i.e. symptomatic patients with a biologically confirmed EV-D68 infection), five probable cases (i.e. patients symptomatic within 48 hours of direct and prolonged contact with a confirmed case) and one excluded case (symptomatic but with EV-D68 PCR negative and no prolonged and direct contact with a confirmed case). Patients developed mild respiratory symptoms with a median duration of 6 days (range: 3–10 days). The outbreak lasted 11

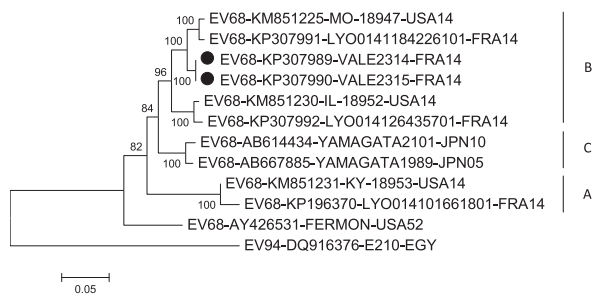


FIG. 1. Phylogenetic analysis based on complete VPI coding sequences of enterovirus D68 (EV-D68) strains. The analysis included the two sequences determined from the respiratory specimens collected from the patients of this study (shown by a dot), eight selected sequences from clinical strains and belonging to genogroups A, B and C (as defined by Tokarz *et al.* in 2012 [4]), and the prototype EV-D68 strain. The prototype coxsackievirus EV-D94 strain was used as an outgroup virus. Genetic distances were calculated with the Tamura–Nei model of evolution. The tree was constructed by the neighbour-joining method using MEGA5 and validated using 1000 bootstrap pseudo-replicates. Designation of strains is as follows: serotype of the strain–GenBank accession number–laboratory number of the isolate–three-letter country ISO code–year of detection. The ID^{VPI} sequences determined in this study were deposited in GenBank database (KP307989–KP307992).

days and stopped 9 days after the implementation of droplet infection control measures.

A few publications describe nosocomial transmission of EV-D68 [3,5], but no outbreak has been previously reported in an elderly healthcare centre.

The source of the outbreak is unknown. It can be speculated that the four primary cases were exposed to contagious healthcare workers or visitors. Afterwards, no healthcare workers recalled having respiratory symptoms the week before the outbreak but we cannot exclude this hypothesis as EV-D68 asymptomatic cases have been reported in adults. However, despite the fact that healthcare workers work in three different units, the outbreak was limited to only one unit, which suggests that they were unlikely to have been involved in transmission to the secondary cases. This transmission was more likely a patient-to-patient transmission in the living room. Indeed, the seven confirmed or probable cases had prolonged contact in this room, no cases were reported after its closure and the incubation period is considered to be short (median: 1.9 days; 95% CI 1.4–2.4 days) [1].

Influenza viruses, parainfluenza viruses, adenoviruses and respiratory syncytial viruses are the most frequent aetiologies of healthcare-acquired viral respiratory diseases.

This report highlighted the following points: (i) EV-D68 should be considered as an agent of nosocomial outbreaks, (ii) EV-D68 should be specifically searched for when molecular detection of rhinovirus/enterovirus is positive in such a context, and (iii) the rapid implementation of hygiene measures (reinforced hand disinfection, facial masks, segregation of the cases) is the main factor to efficiently block the chain of transmission.

Transparency declaration

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