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Letter to the Editor

Preparedness for COVID-19 infection prevention in Korea: a single-centre experience

Sir,

An outbreak of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) disease (COVID-19), which originated in Wuhan, Hubei Province, China, has rapidly spread around the world [1]. In South Korea, the first case of COVID-19, a Chinese individual, was detected on 19th January 2020. As of 30th March 2020, there have been 9786 confirmed cases in South Korea, including 162 deaths [2]. SARS-CoV-2 is transmitted between people through close contact or droplets, and sometimes via airborne particles, especially those formed by aerosol-generating procedures [3]. Asymptomatic or mildly symptomatic patients, including those with low-grade fever or cough, can be contagious to other people, which threatens quarantine or infection control [4]. Based on experience of the Middle East respiratory syndrome coronavirus outbreak in 2015 in South Korea, healthcare-facility-associated nosocomial transmission can be an important route of spreading COVID-19 [5–8].

Incheon (population ~3 million), located approximately 250 km from Daegu, has the largest cluster of COVID-19 cases reported to date in South Korea. Incheon harbour and international airport are located in Incheon, and the city has a considerable floating population. We present the preparedness for COVID-19 infection prevention at Incheon St. Mary's Hospital. The hospital has 900 beds and 24 negative-pressure rooms: five in the emergency department, 10 in the intensive care unit (ICU) and nine on hospital wards.

First, a flow chart was developed for actions in case of suspected COVID-19 infection. We strengthened triage at the first point of entry to the emergency room and at the main hospital entrance for early case detection and prevention of in-hospital transmission. Checklists for patients with febrile respiratory symptoms, travel history or contact status with confirmed COVID-19 cases were prepared. The checklists were handed to medical staff and employees who interact with visitors, including patients, and were used to assess all patients who visited the hospital. Following closure of all entrances to the hospital, except for the main entrance, the number of patient visitors and caregivers was restricted. The need for personal hand hygiene was emphasized to all staff and visitors. Surgical masks were provided to all visitors, employees who interacted with patients, and healthcare workers who took care of patients. Specifically, N95 masks, face shields or goggles, long-sleeved gowns and gloves were provided to healthcare workers in the emergency department and respiratory care centre, and those performing aerosol-generating procedures. Individual visits to the hospital were restricted, except for emergencies, if an individual had travelled to an area with ongoing community transmission within the previous 14 days, or had had close contact with an infected person. Several informative signs for patients with febrile respiratory symptoms were set up at the hospital entrance, and suspected patients with febrile respiratory symptoms were separated from other patients even in the absence of symptoms. The hospital was divided into three zones according to risk stratification (Figure 1). The main hospital was maintained as the clean zone, and a separate temporary building (the moderate-risk zone) was used for suspected COVID-19 cases, such as individuals with febrile respiratory symptoms without an obvious epidemiological link. A separate area in the emergency department (high-risk zone) was used for patients at high risk of COVID-19 infection, such as individuals with febrile respiratory syndromes and a history of contact with confirmed cases of COVID-19.

Once the threat alert level for COVID-19 in South Korea was raised on 23rd February 2020, we designated cohort areas for individuals with febrile respiratory symptoms in the emergency room, the wards (26 beds) and ICU (nine beds). The cohort areas were not accessible to patients with non-febrile respiratory symptoms. When patients with febrile respiratory symptoms came to the emergency room, they were immediately isolated in a negative-pressure isolation room in the cohort area in the emergency department. Well-trained critical care physicians wearing protective equipment took their detailed history, including contact with COVID-19 cases or travel history, and performed a polymerase chain reaction (PCR) test for COVID-19 in accordance with the doctor's recommendation. Based on the recommendation of the infectious disease experts, individuals with negative PCR results for COVID-19 and no evidence of pneumonia were transferred from the emergency room to cohort wards if they were stable, or to the cohort area of the ICU if they were unstable. In the case of evidence of atypical pneumonia and negative PCR results, individuals were transferred from the emergency room to a negative-pressure isolation room, and PCR tests were performed repeatedly in accordance with the infectious disease experts' recommendations.

Well-trained medical staff took care of the moderate-to highly-suspect COVID-19 cases and wore personal protective equipment as a precaution against airborne particles, including

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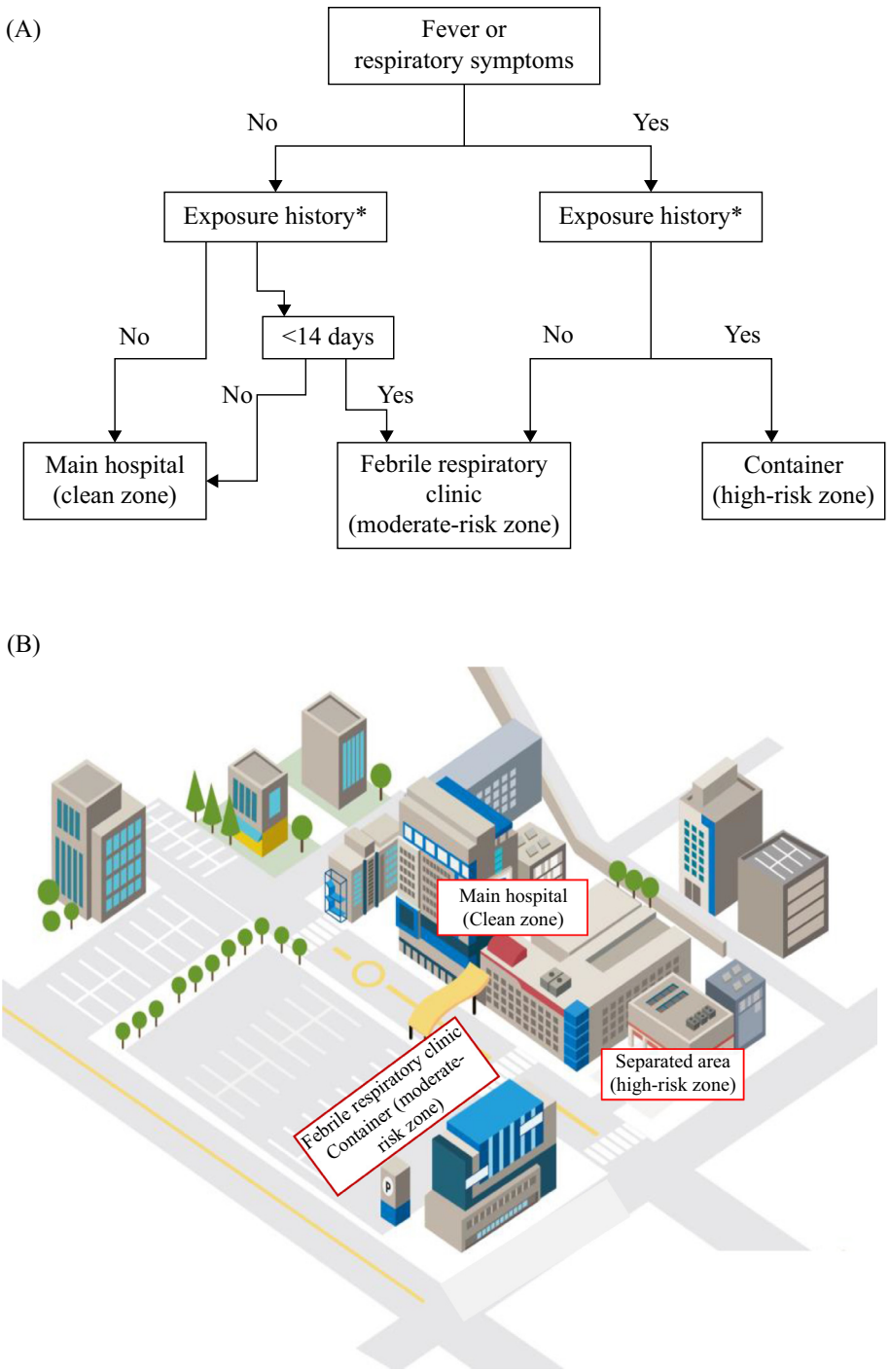

Figure 1. (A) Response flow chart to a suspected COVID-19 case. *Exposure history included contact with a confirmed case or travel history to a risk area. (B) Map of hospital zones set up for risk stratification.

an N95 filtering respirator, a face shield or goggles, a long-sleeved gown and gloves. We prepared daily checklists for medical staff working in the moderate- and high-risk zones, which included questions about body temperature and respiratory symptoms. In the case of any complaints, staff were asked to consult the infectious disease experts. The checklist for healthcare workers was expanded to include all hospital staff.

For prompt diagnosis of COVID-19, we also set up a diagnostic method involving real-time reverse-transcription PCR at the hospital. Samples with warning labels were transported by hand, and the staff transporting the specimens were educated regarding safety issues in accordance with guidelines from the World Health Organization. Laboratory personnel handling and processing the specimens wore the appropriate personal protective equipment.

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To date, from 1105 cases (859 in the moderate-risk zone and 246 in the high-risk zone), 1026 suspected patients have undergone PCR testing for the presence of COVID-19, and no confirmed cases have been identified at the hospital. COVID-19 is an ongoing pandemic. Appropriate infection control measures, as well as early recognition of suspected transmittable disease and effective public health measures, are required to prevent its spread.

Conflict of interest statement
None declared.

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