Possible contact transmission of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) in healthcare settings in Japan, 2020–2021

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To the Editor—The main mode of transmission of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) is via droplets,[1] and to prevent droplet transmission, universal mask wearing has been advised for healthcare workers and those in the community.[2,3] Transmission other than droplet transmission have also been suggested, although evidence is limited.[4] We observed coronavirus disease 2019 (COVID-19) patients who were less likely to be infected via droplet transmission through outbreak investigation of COVID-19 in healthcare settings.

Between November 20, 2020, and February 22, 2021, 7 hospitals in 3 cities in Japan experienced outbreaks of COVID-19. In these institutions, 9 healthcare workers were diagnosed with COVID-19. They were tested for SARS-CoV-2 by RT-PCR or antigen test at a local public health laboratory or at the hospital.

The 9 cases included 7 females (78%), and their overall median age was 67 years (interquartile range [IQR], 35–74) (Table 1). Among these 9 cases, 7 were temporary staff (78%). All of them reported no contacts with other symptomatic people nor groups in their private time in the past 14 days before symptom onset. Notably, 8 of these cases were cleaning staff, and 1 was a radiologist engaged in radiation measurement of the garbage collected from the wards containing suspected COVID-19 cases. None of the subjects had entered COVID-19 wards. Only 1 case entered the ward where an intubated patient without COVID-19 was managed, and none of the others entered wards with patients who underwent aerosol-producing procedures.[5] One case of cleaning staff collected garbage from each patient's room, but she denied talking to patients. All other cases denied talking with COVID-19 cases and other ill patients. Four cases did not take rest breaks including at lunch time (44%), but the other 5 cases had a rest break every work day. Of these 5 cases, 1 had talked with his colleagues during the break. Hand hygiene status during work was uncertain in 4 cases. The radiologist did not use alcohol-based hand rubs nor wash hands during measurements. During work, 8 cases wore a surgical mask (89%) and 1 wore a paper mask while working. Also, 5 cases did not wear a gown (56%) and the other 4 cases wore an apron; only 1 wore a face shield (11%). Personal protective equipment (PPE) was provided for these workers by outsourcing companies but was not adequate and alcohol-based hand rubs were not provided. Thus, some of them bought PPE for themselves, such as eye protection. They had limited opportunities for infection prevention and control (IPC) training. Information about the COVID-19 outbreak was not provided for them in a timely manner.

In this is a case series, workers with COVID-19 did not have a clear history of direct contact with confirmed COVID-19 cases in this healthcare setting during outbreaks. It was less likely that the cases were infected with SARS-CoV-2 in the community because the incidence of COVID-19 in the cities was low (˜1–8 cases per 100,000 population per day) and they were mainly the elderly who denied going out after work and in weekends. We identified 3 possible transmission routes for these cases: indirect contact transmission, transmission via conjunctivae, and airborne transmission. Indirect contact transmission is highly likely because all but 1 case wore medical masks during their work; they frequently touched contaminated surfaces in their daily work; their levels of hand hygiene were suboptimal; and SARS-CoV-2 can be infectious on environmental surfaces for as long as 3 days.[6] Direct contact or droplet transmission via conjunctivae is also possible because 8 orf these 9 cases did not wear eye protection;[7] however, the case infected via conjunctivae has not been reported so far and it is a

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Table 1. Summary of the Nine Cases of COVID-19 possibly infected via contact transmission

No.	Age	Sex	Employment Status/Work Duties	Work Location	IPC Training	Hand Washing	Gloves	Surgical Mask	Gown	Face Shield	Rest Time Activity
1	73	M	Temporary staff Cleaning of the floor of the wards alone	Fixed	Y	Uncertain	Y	Y	N	N	Spends an hour in a room with 10 colleagues within 1 m apart and with ventilation Reads a book with no conversation
2	44	F	Temporary staff Cleaning of the floor of the wards, wash basins and windows, and collecting garbage	Not fixed	N	Before cleaning and at the time after work	Vinyl gloves over cloth gloves	Y	Kitchen apron	N	No rest (half-day shift) No conversation with hospital staff in the locker room. Does not drink anything during a shift
3	61	F	Regular staff Cleaning of the floor of the vacant wards, bedmaking in nap rooms, laundry of patient linens	Fixed	N	Uncertain	Y	Y	Apron Gown over an apron during laundry	N	Drinks water in the laundry room Has lunch alone in the hospital cafeteria
4	70	F	Temporary staff Cleaning of the floor of the wards alone	U	Y	Uncertain	Y	Y	N	U	No rest (half-day shift) No conversation with hospital staff in the locker room
5	74	F	Temporary staff Cleaning of the office, wards, toilet and wash basin	Fixed	Y	Uncertain	Y	Y	N	N	No rest (half-day shift)
6	67	F	Temporary staff Cleaning of the wards and toilets, collection of garbage alone	Not fixed	Y	When hands are dirty following cleaning of each area	Y	N, Paper mask	N	Y	Lunch time and 3 PM. Has lunch with 4–5 colleagues while talking with while wearing a paper mask No window in the break room
7	47	F	Temporary staff Cleaning of the corridor, patient wards and toilets alone	Fixed	Y	After leaving patient's rooms, toilets and following cleaning of each area	Y	Y	Kitchen apron	N	No rest (half-day shift)
8	67	F	Temporary staff Cleaning of toilets and the corridor of inpatient and outpatient cubicles	Fixed	Y	After cleaning each toilet and floor	Y	Y	Apron	N	Has lunch with 6 colleagues in a room with a window
9	35	M	Regular staff Radiologist engaged in nuclear medicine	Fixed	Y	No hand hygiene during measurement	Y	Y	N	N	Takes a rest alone

theoretical possibility. The other possible route of transmission was airborne.[8,9] However, none of these 9 cases had entered the COVID-19 wards, and only 1 had entered the wards where patients were receiving aerosol-generating procedures for only a short time. Thus, it is not likely that they were infected through airborne transmission.

This report also highlights the importance of IPC training for temporary staff in healthcare settings. One study reported that hospital cleaning staff have a higher rate of seropositivity (12 of 96, 6%) compared to other professions.[10] Most of the study participants had received basic IPC training at least once, but none had received COVID-19–specific IPC training. Information about COVID-19 including the disease itself, preventive measures, and the outbreak situation was not shared frequently, and adequate PPE was not provided for these workers. In many healthcare facilities, the temporary staff are often neglected population in terms of IPC training; however, they are also at risk of SARS-CoV-2 infection. COVID-19–specific IPC training for temporary staff is needed in every hospital and facility not only to prevent their infection but also to guarantee the prevention of the spread of disease by these workers.

Our study has several limitations. First, we could not test environmental samples for each event. Second, there was possible recall bias for contact within 2 weeks before symptom onset. However, most of the participants were elderly people who were unlikely to have had an enjoyable personal life after work during the national state of emergency. Third, this finding was based on the wild-type variant circulating before February 2021 in Japan and may not reflect the transmissibility of other variants.

In summary, contact transmission of SARS-CoV-2 can occur among healthcare workers including temporary staff, and they need to be trained to strictly implement hand hygiene and to use appropriate PPEs for SARS-CoV-2, including eye protection.

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Conflict of interest. All authors report no conflicts of interest relevant to this article.

References

1. Gandhi RT, Lynch JB, del Rio C. Mild or moderate COVID-19. *N Engl J Med* 2020;383:1757–1766.
2. Guidance on response to COVID-19. Japanese Society of Infection Prevention and Control website. http://www.kankyokansen.org/modules/news/index.php?content_id=328. Accessed March 26, 2021.
3. COVID-19 information and resources. Japanese Cabinet Secretariat website. https://corona.go.jp/proposal/. Accessed March 26, 2021.
4. Klompas M, Baker MA, Griesbach D, *et al.* Transmission of SARS-CoV-2 from asymptomatic and presymptomatic individuals in healthcare settings despite medical masks and eye protection. *Clin Infect Dis* 2021. doi: 10.1093/cid/ciab218.
5. Clinical questions about COVID-19: questions and answers. Centers for Disease Control and Prevention website. https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html. Accessed March 26, 2021.
6. van Doremalen N, Bushmaker T, Morris DH, *et al.* Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *N Engl J Med* 2020;382:1564–1567.
7. Chu DK, Akl EA, Duda S, *et al.* Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *Lancet* 2020;395:1973–1987.
8. Samet JM, Prather K, Benjamin G, *et al.* Airborne transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): what we know. *Clin Infect Dis* 2021. doi: 10.1093/cid/ciab039.
9. Katelaris AL, Wells J, Clark P, *et al.* Epidemiologic evidence for airborne transmission of SARS-CoV-2 during church singing, Australia, 2020. *Emerg Infect Dis* 2021;27:1677–1680.
10. Alkurt G, Murt A, Aydin Z, *et al.* Seroprevalence of coronavirus disease 2019 (COVID-19) among healthcare workers from three pandemic hospitals of Turkey. *PLoS One* 2021;16(3):e0247865.

Effect of coronavirus disease 2019 (COVID-19) pandemic on catheter-related bloodstream infections: Control measures should not be relaxed

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To the Editor—Patient safety is a healthcare discipline that aims to minimize adverse events and eliminate preventable harm in health care.[1] Patient safety strategies involve the implementation interventions, supervision, surveillance of critical processes, and prevention and control of infections. These strategies include the control of healthcare-associated infections (HAIs) by recognizing risk factors for infection in patients as well as implementing preventive procedures, education, and good practices.[2]

Among HAIs, central-line–associated bloodstream infection (CLABSI) has a high impact on the health of patients, causing thousands of deaths annually and costing billions of dollars globally. Several strategies have been implemented to reduce the incidence of CLABSI in health institutions, including the

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