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Concise Communication

Discontinuation of admission screening for coronavirus disease 2019 (COVID-19) and the impact on in-hospital clusters of COVID-19: Experience at a tertiary-care center

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Abstract

We evaluated the impact of discontinuing universal preadmission screening for severe acute respiratory coronavirus virus 2 (SARS-CoV-2) on the occurrence of nosocomial clusters of coronavirus disease 2019 (COVID-19) during the SARS-CoV-2 o (omicron) variant period. No increasing trend in nosocomial clusters was observed during community-based surges before and after discontinuation. This finding supports the safety of the practice change.

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Preventing nosocomial severe acute respiratory coronavirus virus 2 (SARS-CoV-2) transmission in inpatient settings is challenging because SARS-CoV-2 is highly contagious even with the use of personal protective equipment (PPE), especially after the emergence of SARS-CoV-2 o (omicron) variants.[1] Healthcare institutions have faced nosocomial transmission of SARS-CoV-2, sometimes leading to outbreaks despite enhanced infection prevention practices. In an attempt to reduce nosocomial transmission of SARS-CoV-2, universal preadmission screening for coronavirus disease 2019 (COVID-19), including asymptomatic individuals, has been commonly implemented.[2,3] However, the effectiveness of this approach is controversial because of concerns over suboptimal sensitivity when testing asymptomatic or minimally symptomatic individuals[3] and because of the uncertainty over infectiousness of those who test positive.[4] Moreover, excessive screening for SARS-CoV-2 may lead to increased healthcare costs,[5] prolonged length of stay,[6] and unnecessary isolation of noninfectious individuals.[7]

In Japan, an upsurge of COVID-19 due to the SARS-CoV-2 o (omicron) variant occurred from July through September 2022 (seventh pandemic wave) and from December 2022 through January 2023 (eighth pandemic wave). In November 2022, between the these COVID-19 waves, the study institution discontinued universal preadmission screening for SARS-CoV-2. As part of an effort to streamline infection prevention interventions, testing was continued only for patients being admitted through the emergency room or with symptoms suggestive of COVID-19. We retrospectively evaluated the impact of the discontinuation of universal preadmission screening for SARS-CoV-2 on the occurrence of nosocomial clusters of COVID-19 at a tertiary-care center in Japan.

Methods

We conducted a before-and-after study from July 2022 through January 2023 at Fujita Health University Hospital, a 1,376-bed academic tertiary-care medical center in Aichi, Japan. A nosocomial COVID-19 cluster was defined as identification of 2 or more SARS-CoV-2–positive cases within 2 days with an epidemiological link at the same ward, including both inpatients and healthcare personnel (HCP). The duration of a cluster was defined as the number of days between the date of the positive SARS-CoV-2 test of the index case and the date of the last related case. Once a cluster was identified, the infection control department investigated the cluster and performed SARS-CoV-2 testing of individuals (both HCP and patients) who had come into close contact with the index case. The study institution has mixed bedrooms, including 4-bed rooms with beds separated by curtains and single-bed private rooms. A limited number of negative-pressure rooms are available. During the seventh pandemic wave, we provided universal preadmission screening to proactively identify patients. Under this protocol, all patients underwent routine preadmission screening the day before, or in the case of Sundays and holidays, 2 days before scheduled admission. We discontinued universal preadmission screening on November 1, 2022, before the eighth pandemic wave, except for residual screening tests that had already been scheduled before the discontinuation date for elective admissions after the date. The test used for preadmission screening

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Table 1. Nosocomial Clusters of COVID-19 During the Seventh (June 2022–September 2022) and Eighth Pandemic Waves (December 2022–January 2023)

Cluster No.	Onset Date (month/year) Ward	Index Case	SARS-CoV-2-Positive Individuals Identified During the Cluster (No.)	Duration of Outbreak, Days	Source of Cluster	Likelihood of Cluster Prevented by Universal Preadmission Screening
Seventh wave of COVID-19 pandemic in Japan						
1	7/2022 Surgery	HCP	HCP (16) Patient (7)	18	Transmission from the index HCP to other HCP during the incubation period, leading to a cluster among patients in close contact with infected HCP, and those who were in the same room with infected patients.	No
2	7/2022 Medicine	HCP	Patient (7) HCP (5)	8	Similar to cluster 1	No
3	8/2022 Surgery	HCP	HCP (12) Patient (4)	17	Similar to cluster 1	No
4	8/2022 Medicine	HCP	HCP (11) Patients (10)	13	Similar to cluster 1	No
5	8/2022 Surgery	HCP	HCP (7) Patient (5)	8	Similar to cluster 1	No
6	8/2022 Medicine	HCP	HCP (9) Patient (1)	9	Transmission from the index HCP to other HCP was the main cause of the cluster. Transmission to patient only occurred in 1 patient.	No
7	8/2022 Surgery	Patient	Patient (7) HCP (2)	10	The index patient developed COVID-19 from unknown source during prolonged hospitalization. Transmission occurred among patients sharing same room.	No
Eighth wave of COVID-19 pandemic in Japan						
8	12/2022 Medicine	HCP	Patient (6) HCP (5)	23	Similar to the cluster 1.	No
9	12/2022 Medicine	HCP	Patient (24) HCP (12)	16	Similar to the cluster 1. Multiple transmissions occurred simultaneously between patients and HCP.	No
10	1/2023 Medicine	HCP	Patient (6) HCP (2)	10	Similar to cluster 1	No
11	1/2023 Surgery	HCP	HCP (6) Patient (2)	5	Similar to cluster 1	No
12	1/2023 Medicine	HCP	HCP (6) Patient (3)	6	Similar to cluster 1.	No
13	12/2022 Medicine	Patient	HCP (16) Patient (16)	13	The index patients developed COVID-19 from unknown source during prolonged hospitalization. Patients in the same room with the index patient developed COVID-19. Patient-to-HCP and HCP-to-patient transmission also occurred.	No
14	12/2022 Medicine	Patient	Patient (6) HCP (4)	9	Similar to cluster 13	No
15	1/2023 Medicine	Patient	Patient (11) HCP (4)	10	The index case was identified within 48 h of admission. Cluster development was similar to cluster 13.	Yes
16	1/2023 Medicine	Patient	Patient (13) HCP (4)	12	Similar to cluster 13	No

was saliva polymerase chain reaction (PCR) for SARS-CoV-2. The decision to discontinue the practice was based on the consistently low positivity rates of preadmission screening and the shortened incubation period of the SARS-CoV-2 o (omicron) variants. After November 1, 2022, only those who were admitted through the emergency room were screened by nasopharyngeal rapid antigen testing for SARS-CoV-2.

Other measures in place to prevent nosocomial transmission of SARS-CoV-2 remained unchanged throughout the study period. Both hospitalized patients and HCP were required to wear a mask in the hospital. HCP wore personal protective equipment (ie, an N95 respirator, eye shield, gown, and gloves) when encountering patients with COVID-19. Hospitalized patients who developed symptoms suggestive of COVID-19 were tested for SARS-CoV-2 by PCR or rapid antigen tests. HCP underwent testing if they developed symptoms, and the study institution strongly discouraged presenteeism. Visitors were restricted during this period except when the attending physicians provided permission (eg, end-of-life care discussion). Visitors were also required to wear masks during their

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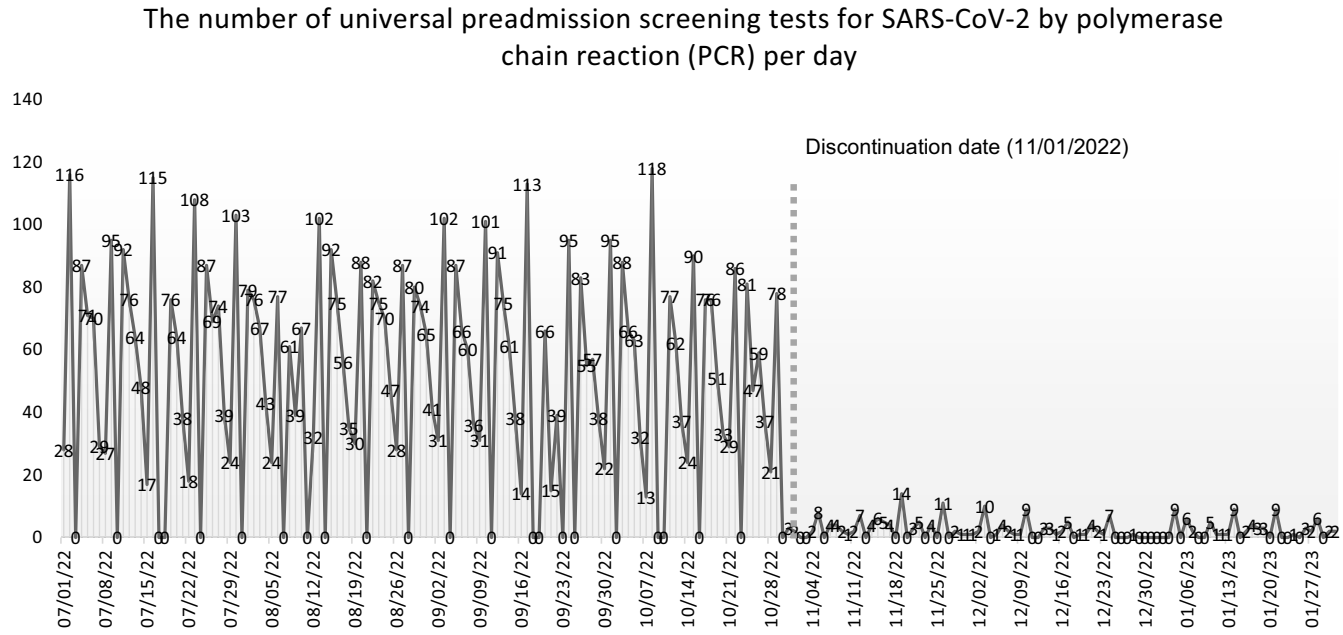

Fig. 1. The number of universal preadmission screening tests for SARS-CoV-2 by polymerase chain reaction (PCR) per day.

hospital visits. Ethical approval for this research was granted by the Ethics Committee of Fujita Health University.

Results

During the study period, 7 and 9 nosocomial clusters occurred during the seventh and eighth pandemic waves, respectively. The mean number of monthly elective admissions and emergent admissions from the emergency department during the study period were 1,641 and 949, respectively. The mean durations of the clusters were 11.9 days and 11.7 days, respectively. Details of each cluster are shown in Table 1. The index cases in all except 1 of the clusters were either patients undergoing prolonged hospitalization or HCP. Only 1 cluster during the eighth wave might have been prevented if preadmission screening had been continued. The index HCP in most instances likely transmitted SARS-CoV-2 to patients during the asymptomatic period. Figure 1 shows the number of preadmission PCR screening tests conducted during the study period. The maximum numbers of preadmission screening PCR tests per month were 1,651 during the seventh wave and 71 during the eighth wave. Monthly numbers of tests and positivity rates of preadmission SARS-CoV-2 PCR screening from July 2022 through February 2023 were 1,635 tests (6 positive, 0.36%), 1,651 tests (29 positive, 1.76%), 1,417 tests (9 positive, 0.64%), 1,442 tests (4 positive, 0.28%), 92 tests (2 positive, 2.17%), 62 tests (0 positive, 0%), and 71 tests (0 positive, 0%), respectively.

Discussion

The number of nosocomial clusters of COVID-19 remained stable after discontinuation of universal preadmission screening at our institution. The index cases of the clusters were suspected in either patients who were undergoing prolonged hospitalization or HCP who were asymptomatic and later developed COVID-19. Thus, universal preadmission screening during predominance of the SARS-CoV-2 o (omicron) variant may have limited value in reducing nosocomial transmission of SARS-CoV-2.

Although it is not clearly understood how the index patients with prolonged hospitalization contracted COVID-19, there are several potential routes of nosocomial transmission of SARS-CoV-2 in healthcare settings: (1) from another patient who was infected but asymptomatic, (2) from HCP with asymptomatic or minimally symptomatic COVID-19, and (3) from visitors with unrecognized COVID-19. The effectiveness of universal preadmission screening is likely limited because it does not address the latter 2 potential transmission routes. Moreover, because the incubation period has become shorter with predominance of the SARS-CoV-2 o (omicron) variants,[8] the negative predictive value of a single screening test at admission may be decreasing. Identification of infected HCP is also challenging. HCP who were likely the index cases of the nosocomial clusters were largely asymptomatic when suspected transmission to hospitalized patients occurred, even though they were already contagious at the time. Transmission of SARS-CoV-2 during the incubation period is one of the most challenging aspects in controlling its spread, especially in healthcare settings[9,10]

A recent US study noted that the incidence of positive SARS-CoV-2 admission screening tests (including symptomatic and asymptomatic individuals) was only 1.3%.[3] More than half of the test-positive, asymptomatic patients might not have been infectious based on the cycle threshold (Ct) values.[3] Recently, the Society for Healthcare Epidemiology of America published a guidance document recommending against universal preadmission screening for SARS-CoV-2 for asymptomatic individuals based on thorough review of potential benefits and risks of this approach based on existing, albeit limited, evidence.[7] The recommendations from SHEA are a step forward in calibrating infection prevention practices for COVID-19, which have remained largely static since the beginning of the pandemic despite major changes in the pathogen (ie, the predominance of SARS-CoV-2 o variant), the hosts (ie, immunity from vaccination and past infection), and treatment options (ie, availability of antivirals). Infection prevention measures should be reviewed and adjusted accordingly

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based on assessment of the overall risk and resources while ensuring the safety of hospitalized patients and HCP.

The present study had several limitations. These findings may not be applicable to institutions in other countries because of the differences in inpatient COVID-19 prevention protocols (eg, universal masking). We did not comprehensively perform contact tracing or genotyping to definitively conclude the routes of nosocomial transmission of SARS-CoV-2. Since the effectiveness of universal preadmission screening might be affected by the local incidence of COVID-19, these findings may not apply to other settings or periods. Lastly, since the discontinuation of universal preadmission screening was only applied to patients with scheduled admission, the safety of discontinuing COVID-19 screening on patients admitted from emergency departments warrants further study.

Optimal infection control practice for COVID-19 in inpatient settings is evolving, and some COVID-19 infection control measures that were appropriate earlier in the pandemic may now be considered excessive. Our experience suggests that universal preadmission screening may have limited value in preventing nosocomial transmission of SARS-CoV-2 during the o (omicron) variant period.

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