Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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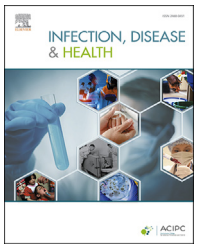

Letter to the Editor

Universal testing for SARS-CoV-2 infection on admission among hospitalized emergency patients: A survey report from a single facility in Tokyo

KEYWORDS
SARS-CoV-2;
COVID-19;
RT-PCR;
universal screening

Highlights

- We aimed to determine the prevalence of SARS-CoV-2 infection among urgently hospitalized patients during the COVID-19 pandemic.
- The prevalence of SARS-CoV-2 infections was 6.2% (asymptomatic 0.25%, symptomatic 31%).
- Universal screening of asymptomatic patients using RT-PCR tests revealed a low prevalence of infection.
- Screening and testing patients for COVID-19 symptoms should be given higher priority than universal PCR testing.

To the Editor

The coronavirus disease 2019 (COVID-19) pandemic is a global public health emergency. Nosocomial infections are a risk. Approximately 40—45% of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections are asymptomatic [1]. Individuals with asymptomatic infection can transmit SARS-CoV-2 to others for 14 days or longer [1].

Our 450-bed university hospital, located in north-eastern Tokyo, is a core hospital in the area and provides advanced medical care. There was a total of 13,535 inpatients in all departments in 2019. On April 17, 2020, five staff members were confirmed to have SARS-CoV-2 infection. This led to restrictions being imposed on inpatient and outpatient services. In order to prevent nosocomial infections, real-time reverse transcription polymerase chain reaction (RT-PCR) testing was subsequently made mandatory for all hospitalized patients. All patients undergoing emergency hospitalizations were tested for SARS-CoV-2 on admission, and patients were isolated until a negative test result was confirmed.

Tokyo, with a population of approximately 14 million, has the highest incidence of COVID-19 in Japan, with 25,732 confirmed cases being reported between January 14 and September 30, 2020 (Fig. 1). In Japan, the value of PCR testing of all hospitalized patients, including those who are asymptomatic, is unclear. This issue is especially important for emergency admissions because testing cannot be done in advance.

We aimed to determine the prevalence of SARS-CoV-2 infection among urgently hospitalized patients. Patients with signs consistent with SARS-CoV-2, including fever, respiratory symptoms, hypoxemia, or X-ray evidence of lower respiratory tract disease were classified as symptomatic. Patients in the neonatal intensive care unit were excluded from the analysis. Our hospital performs SARS-CoV-2 RT-PCR tests using three different platforms: LightMix® Modular SARS-CoV (COVID-19) (Roche Diagnostics K.K., Tokyo, Japan), Xpert® Xpress SARS-CoV-2 (Cepheid, Sunnyvale, CA, USA), and Smart Gene® SARS-CoV-2 (Mizuho Medy Co., Ltd., Saga, Japan).

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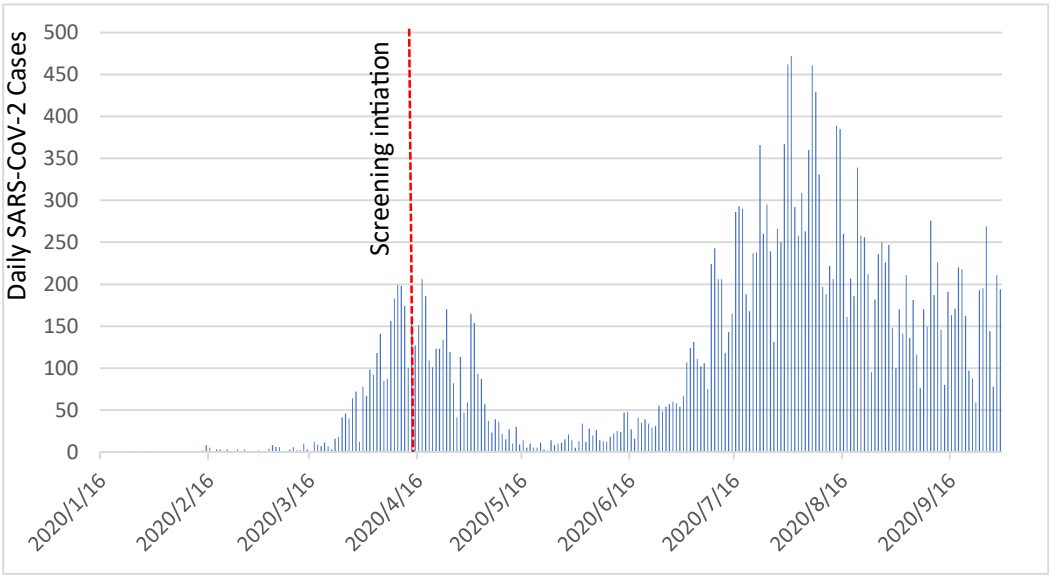

Figure 1 Number of positive cases of Severe acute respiratory syndrome coronavirus-2 in Tokyo, January 16 to September 30, 2020.

Between April 17 and September 30, 2020, among all SARS-CoV-2 RT-PCR tests of nasopharyngeal swabs, 1628 asymptomatic patients were identified, including 496 patients in the Emergency Department, 264 patients in the Internal Medicine Department, 183 patients in the Neurosurgery Department, 167 patients in the Pediatrics Department, 134 patients in the Surgery Department, 125 patients in the Obstetrics and Gynecology Department, 83 patients in the Urology Department, and 176 patients in other departments. The requirement for informed consent was waived because universal screening was conducted as a standard procedure, not as research. This study was performed according to the Declaration of Helsinki and was approved by the ethics committee of Tokyo Women's Medical University.

There were four cases of SARS-CoV-2 infection among the 1628 asymptomatic emergency inpatients tested. One patient was an elderly woman with right lower abdominal pain who was diagnosed with an appendix mucus tumor. She had no fever, respiratory symptoms, hypoxemia, or pneumonia on radiography on admission. There were three cases in younger obstetric patients, among whom two were admitted owing to the commencement of labor and one was hospitalized owing to severe hyperemesis gravidarum. These patients were isolated, proper personal protective equipment was used in their care, and they were transferred to the COVID-19 medical ward after the positive test result was confirmed. The elderly woman developed a fever after admission but no respiratory symptoms or hypoxemia. One of the obstetric patients developed anosmia and

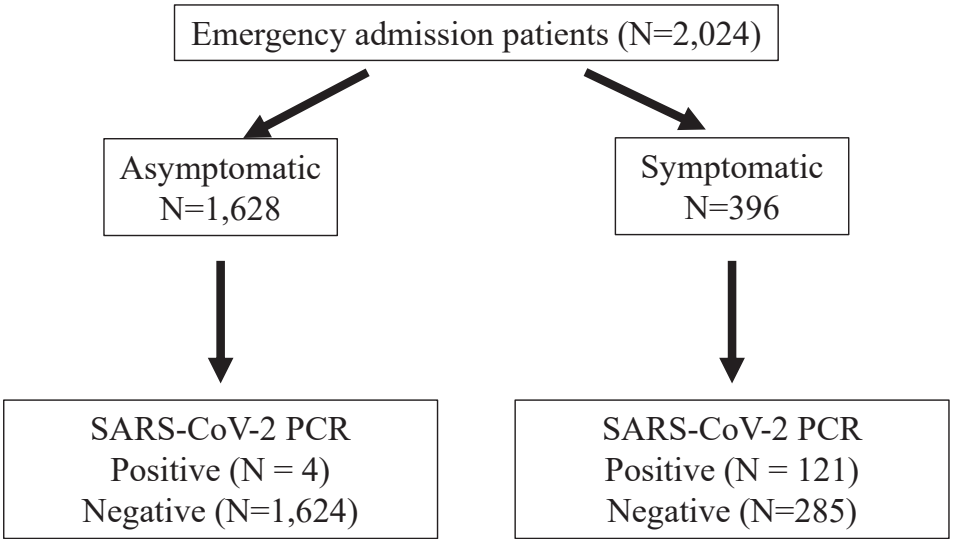

Figure 2 Inclusion schematic flow of this study. Between April 17 and September 30, 2020, among all SARS-CoV-2 RT-PCR tests of nasopharyngeal swabs, 2024 patients were identified.

ageusia 2 days after admission, and the other two positive patients remained asymptomatic throughout their hospitalization.

Of all the emergency patients hospitalized during the study period, 396 were classified as symptomatic because they had fever, respiratory symptoms, hypoxemia, or X-ray evidence of lower respiratory tract disease. Out of the 396 patients, 121 (31%) were SARS-CoV-2 positive.

The prevalence of SARS-CoV-2 infections on admission among hospitalized emergency patients was 6.2% (asymptomatic 0.25%, symptomatic 31%) (Fig. 2). Furthermore, the incidence of new cases of Covid-19 in Tokyo between April to September 2020 was 25,206 [2]. The population of Tokyo over the same period was 14,082,072 [3], which makes the detection rate of 0.18%. Therefore, the detection rate among asymptomatic patients in our study was similar to the detection rate in the general Tokyo population. In Tokyo, two previous studies, using universal PCR testing, showed an asymptomatic SARS-CoV-2 prevalence of 0.03% (2 out of 6224) [4] and 0.07% (1 out of 1376) [5]. Universal testing of asymptomatic patients in Tokyo using SARS-CoV-2 RT-PCR tests revealed a low prevalence of infection; therefore screening patients for the presence of COVID-19 symptoms on admission and testing those with symptoms should be given higher priority than universal PCR testing.

In conclusion, the result of universal SARS-CoV-2 screening at the time of emergency hospitalization in Tokyo differed considerably, depending on the presence or absence of symptoms. The proportion of asymptomatic patients who test SARS-CoV-2-positive on RT-PCR screening for SARS-CoV-2 at the time of emergency admission, and thus the effectiveness of this approach, depends on the circulation of newly infected individuals in the community. Therefore, caution should be exercised when interpreting the results of the present study in areas with different SARS-CoV-2 prevalence. Areas of high prevalence may still benefit from universal testing. The COVID-19 pandemic is ongoing, and further research is needed to provide community-specific data to guide emergency care and general public health measures.

Authorship statement

Shoko Marshall: Data curation, Conceptualization, Methodology.
Motonao Ishikawa: Writing- Original draft preparation.
Hiroaki Tanaka: Data curation.
Hiroshi Sakura: Supervision, Validation.
Yasuko Uchigata: Writing- Reviewing and Editing.

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Provenance and peer review

Not commissioned; externally peer reviewed.

Ethics

This study was performed according to the Declaration of Helsinki and was approved by the ethics committee of Tokyo Women's Medical University.

Data availability statement

All the relevant data are contained in the article.

Conflict of interest

None.

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Shoko Marshall
Department of Medicine, Tokyo Women's Medical University Medical Center East, 2-1-10 Nishiogu, Arakawaku, Tokyo, 116-8567, Japan

Motonao Ishikawa*
Department of Medicine, Tokyo Women's Medical University Medical Center East, 2-1-10 Nishiogu, Arakawaku, Tokyo, 116-8567, Japan

Hiroaki Tanaka
The Medical Training Centre for Graduates, Tokyo Women's Medical University Medical Center East, 2-1-10 Nishiogu, Arakawaku, Tokyo, 116-8567, Japan

Hiroshi Sakura
Department of Medicine, Tokyo Women's Medical University Medical Center East, 2-1-10 Nishiogu, Arakawaku, Tokyo, 116-8567, Japan

Yasuko Uchigata
Tokyo Women's Medical University Medical Center East, 2-1-10 Nishiogu, Arakawaku, Tokyo, 116-8567, Japan

*Corresponding author. Fax: +81 3 5855 6258.
E-mail address: mishikawa-tky@umin.ac.jp (M. Ishikawa)

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