

# Infection risk in a gastroenterological ward during a nosocomial COVID-19 infection event

To the Editor,

The reported rate of severe cases and the case-fatality rate for coronavirus disease (COVID-19) is high among patients with comorbidities and the elderly,<sup>1</sup> but few reports have been published on the infection risk. After a health care professional working in the gastroenterological ward at this hospital contracted COVID-19, a case of possibly nosocomial COVID-19 was identified. This report describes a study on the risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection among patients hospitalized with gastrointestinal disorders when health care workers implement appropriate measures to prevent contact and droplet transmission.

This retrospective study was conducted with the approval of the Institutional Ethics Review Board. Polymerase chain reaction (PCR) testing was carried out for 87 patients who were hospitalized during the period when a health care professional was suspected to have contracted the active infection at the workplace from February to March 2020, in Fukuchiayma City Hospital gastroenterological ward. The clinical characteristics of the study patients are shown in Table 1.

To assess the risk of COVID-19 infection, the risk-exposure category and underlying conditions and their relationship with a positive PCR result were examined. Risk-exposure categories, which based on whether patients and health care professionals use personal protective equipment, were assessed using interim US guidance for risk assessment and public health management for health care personnel exposure in health care setting to patients with 2019 novel coronavirus.<sup>2</sup> Health care professionals wore a surgical mask while working and removed the mask during breaks. Not all patients wore surgical masks. The age-adjusted Charlson Comorbidity Index (CCI), a method of predicting mortality by classifying or weighting comorbid conditions and age, was used to assess the effect of underlying conditions on exposure risk.<sup>3</sup>

Only 1 of 87 patients (1.1%) tested positive on PCR for COVID-19. The patient was almost asymptomatic. The patient who tested positive for COVID-19 was in the medium-risk exposure category with a CCI of 8 and had decompensated cirrhosis.

The basic reproduction number ( $R_0$ : the number of people a single patient is expected to infect) for COVID-19 is estimated at 2.2 (1.4-3.9).<sup>4</sup> In the present study, low rates of SARS-CoV-2 infection were observed among patients. During the peri-infection period, because the study center was in an influenza-endemic area, health care professionals at the hospital were obligated to wear a surgical mask and instructed to be diligent with handwashing. Surgical masks are reported to prevent transmission of coronaviruses.<sup>5</sup> These measures to prevent contact and droplet transmission were

considered to have been practised adequately and were relatively successful at preventing nosocomial infection. The CCI<sup>3</sup> is used as a prognostic indicator and to determine treatment strategies for gastroenterological diseases.<sup>6,7</sup> Therefore, the CCI was used in this study to assess the risk conferred by underlying diseases for COVID-19. The patient who tested positive for SARS-CoV-2 was given a high CCI of 8. Elderly patients and patients with many comorbidities are considered at risk of SARS-CoV-2 infection.

**TABLE 1** Characteristics of the study population

Clinical characteristics of the study patients (n = 87)	
Age, median (range), y	70 (21-94)
Male sex, n (%)	50 (57.5)
Current smoker, n (%)	25 (28.7)
Immunosuppressant use, n (%)	16 (18.4)
Primary disease, n (%)	
Cancer	39 (44.8)
Liver cirrhosis	5 (5.7)
Chronic hepatitis	5 (5.7)
Cholangitis, cholecystitis	10 (11.5)
Pancreatitis	5 (5.7)
Gastrointestinal bleeding	6 (6.9)
Ileus	5 (5.7)
Peritonitis	4 (4.6)
Other digestive disorders	8 (9.2)
Coexisting disorder, n (%)	
Chronic obstructive pulmonary disease	11 (12.6)
Diabetes mellitus	21 (24.1)
Hypertension	37 (42.5)
Coronary heart disease	14 (16.1)
Chronic renal failure	3 (3.4)
Age-adjusted Charlson Comorbidity Index	
0-5	38 (43.7)
6	13 (14.9)
7	12 (13.8)
8	5 (5.7)
≥9	19 (21.8)
Exposure category	
Low	30 (34.5)
Medium	50 (57.5)
High	7 (8.0)


No patient in the low-risk exposure category or with high-risk underlying conditions was infected with SARS-CoV-2 at this hospital. Therefore, appropriate implementation of measures against contact and droplet transmission appear adequate to minimize nosocomial spread are of utmost importance in preventing COVID-19 transmission.

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## CONFLICT OF INTERESTS

The authors declare they no conflict of interests.

Tasuku Hara<sup>1,2</sup>   
 Chie Yamamoto<sup>2,3</sup>  
 Ryo Sawada<sup>3</sup>  
 Tomoya Ohara<sup>1</sup>  
 Kohei Oka<sup>1</sup>  
 Naoto Iwai<sup>1</sup>  
 Yutaka Inada<sup>1</sup>  
 Toshifumi Tsuji<sup>1</sup>  
 Takashi Okuda<sup>1</sup>  
 Toshiyuki Komaki<sup>1</sup>  
 Keizo Kagawa<sup>1</sup>

<sup>1</sup>Department of Gastroenterology and Hepatology,  
 Fukuchiyama City Hospital, Kyoto, Japan

<sup>2</sup>Infection Control Team (ICT), Fukuchiyama City Hospital, Kyoto, Japan

<sup>3</sup>Department of Respiratory Medicine, Fukuchiyama City Hospital,  
 Kyoto, Japan

## Correspondence

Tasuku Hara, Department of Gastroenterology and Hepatology,  
 Fukuchiyama City Hospital, 231 Atsunaka-cho,  
 Fukuchiyama-shi, Kyoto 620-8505, Japan.  
 Email: [t-hara@koto.kpu-m.ac.jp](mailto:t-hara@koto.kpu-m.ac.jp)

## ORCID

Tasuku Hara  <https://orcid.org/0000-0002-1751-6201>

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