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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Commentary

Gastrointestinal endoscopy operation—A potential transmission risk for SARS-CoV-2

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To the Editor

The global outbreak of Coronavirus disease 2019 (COVID-19) was characterized as a pandemic by World Health Organization on March 11, 2020,[1] and this pandemic has posed a great impact on the public health and socioeconomic around the world, especially on developing countries. As of May 6, 2020, almost 3.6 million confirmed cases of COVID-19 have been reported to World Health Organization, and nearly 250,000 have lost their lives.[2] Health care workers (HCWs) are at high risk for acquiring infection while fighting the pandemic at the frontline, and several studies report that incidents of nosocomial infection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among HCWs are common.[3,4] And the infection of HCWs appears not only in infectious disease and respiratory departments, but also in other departments that may be easily overlooked, such as gastroenterology departments.[3] Because HCWs involved in gastrointestinal (GI) endoscopy operations have close contact with patients, both occupational exposure and cross-infection occur easily. Accordingly, GI endoscopy operations may increase the risk of transmission of SARS-CoV-2.

A few reasons are as follows. To start with, during the pandemic, the use of respiratory fiberoptic bronchoscopes in the general ward was stopped in most hospitals in many countries. Even if it was not stopped, the risk of infection was low due to rigorous personal protections among HCWs in respiratory departments, such as the use of N95 masks, protective suits, and other personal protective equipment (PPE). However, HCWs performing GI endoscopy operations in general outpatient clinics are vulnerable to the SARS-CoV-2 because of the lack of awareness of the risk of infection, inadequate protective measures, and nonstandard protective procedures (eg, masks may not be worn properly).[5] Second, health systems in many countries were not well-prepared for this sudden, fast-spreading, and widespread pandemic, which has led to a shortage of medical supplies, such as face shields, masks, gloves, goggles and gowns, and so on, in more and more countries, thus increasing the risk of infection among HCWs. Besides, some people do not correctly understand the seriousness of the pandemic, leading to incomprehension of citizens for some of prevention and control measures issued, or even overlook, which will accelerate the spread of the pandemic. Third, several studies indicated that a significant portion of infected patients never developed any symptoms (asymptomatic) or even those who eventually developed symptoms ("presymptomatic") could transmit SARS-CoV-2 to others before showing symptoms,[6-8] which would increase the occupational exposure risk and the possibility of cross-infection of HCWs in the GI endoscopy room, thereby possibly causing "Butterfly Effect." Fourth, viral host receptor angiotensin-converting enzyme 2[9] was found in both the upper and lower GI tract where it was expressed at nearly 100-fold higher levels than in respiratory organs[10] and Xiao et al demonstrated both viral RNA and viral nucleocapsid protein staining were detected in esophageal mucous tissue.[11] We now know from several recent studies digestive symptoms are common in patients with COVID-19 and part of patients experience diarrhea as the first symptom in their disease course or present digestive symptoms alone.[12-14] Of note, a recent study reported that viral RNA has been detected in as many as 53% of sampled patients' stool samples and nearly 23.3% of the stools were still positive after the respiratory viral nucleic acid converted to negative.[11] All of the above supported that oral-fecal transmission might be a potential transmission route for COVID-19. Finally, the process of GI endoscopy diagnosis and treatment requires the use of water and CO_2 insufflation for luminal examination of the GI tract. Use of multiple interventions during the multiple endoscopic procedures such biopsy forceps especially during colonoscopy can carry a risk of recognized and unrecognized spill to the endoscopist face.[5,15,16] Furthermore, the risk of bioaerosolization of GI secretions is a real risk.[17,18]

Much can be done to reduce the risk of SARS-CoV-2 transmission caused by GI endoscopy operations. Due to HCWs in endoscopy units are at high risk for acquiring COVID-19, many international/national societies, such as the Joint GI Society (ie, American Society of Gastrointestinal Endoscopy, American Association for the Study of Liver Diseases, American College of Gastroenterology, and American Gastroenterology Association), European Society of GI Endoscopy (ESGE), Board of the Chapter of Gastroenterologists of Singapore Academy of Medicine, have

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changed or updated their recommendations for GI endoscopic examinations.[19-21] According to their recommendations, first, prescreening should be carried out before arranging endoscopy for patients and the nonurgent/elective procedures not only should be temporarily postponing but also should be further classified into nonurgent/postpone and nonurgent/perform depending on the clinical need of the endoscopy. Second, once a patient was scheduled for an endoscopic procedure, stratifying patients for risk of COVID-19 should be carried out before the examination and the use of PPE during the examination was also required. Basic PPE included gloves, mask, eye shield/goggle, or face shield, and gown, and ESGE recommended that 2 pairs of gloves, respiratory mask, and related equipment were required for high-risk individuals.[20] Finally, Joint GI society and ESGE recommended that all patients should be followed up by telephone 7-14 days after the procedure during the pandemic.[19,20]

At this critical time, our hospital also has implemented a series of measures to reduce transmission risk in the GI Endoscopy unit. First of all, patients, who seek GI endoscopy examination or treatment, were required to fill Health QR code beforehand and only those who had no symptoms of COVID-19 and no history of contact of confirmed or suspected cases, could enter outpatient. The Health QR code is a digital health assessment certificate that presents different colors depending on the health information and epidemiological history reported online by residents. Residents with a green code indicated they had a low current risk of being infected, while residents with yellow or red codes were required to self-quarantine for 7 or 14 days as well as to report their daily health status to exclude infection before the codes turned green. Secondly, once a patient was admitted to the outpatient hall, inquiring epidemiological history again and taking temperature for patients were required, followed by chest CT scans and nucleic acid PCR or serological test. Only those, who possessed green Health QR code, did not have any symptoms of COVID-19 and had a negative result for SARS-CoV-2 detection, were admitted to the GI Endoscopy unit for examination or treatment. The use of PPE during the examination was also required in our hospital. Especially of note, up to now, no GI operation-related COVID-19 nosocomial infections have been reported in our hospital.

Form the above, we can know that strict preinspection and screening procedures, and comprehensive protective measures are needed to curb the spread of COVID-19 in digestive endoscopy. So, at this critical time all hospitals should take the best protective measures according to their own conditions to minimize the risk of transmission caused by GI endoscopy. Hopefully, all suggestions mentioned above could benefit to worldwide HCWs during the COVID-19 pandemic.

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