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Critical importance of early introduction of prevention measures for SARS-CoV-2 infection in endoscopy units

The coronavirus disease-19 (COVID-19) started in Wuhan, China, in December 2019 and was declared a pandemic by the World Health Organization on March 11, 2020. Since then, more than 4,800,000 cases have been confirmed worldwide, with the infection spreading in 215 countries all over the world.¹ The only way to fight the pandemic is to adopt the required measures to protect the population from spread of infection. Health care providers (HCPs) are a population at high risk for infection because of their close contact with patients.² In Spain and northern Italy, about 20% of infected people are HCPs.^{3,4}

HCPs in endoscopy units are at increased risk of infection by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), mainly from inhalation of airborne droplets.⁵ Periendoscopic aerosolized infections have also been reported, making upper GI endoscopy a high-risk procedure.⁶ In addition, viral RNA, although not equivalent to transmissible intact viral particles, has been found in patients' stool, and angiotensin-converting enzyme II receptor used by the virus to enter human cells, is widely expressed in the intestinal tract, making lower GI endoscopy a procedure of uncertain risk status.^{7,8} Furthermore, infected HCPs may transmit the infection to their colleagues, patients, families, and communities, as shown by reports of hospital-based epidemics in European countries.⁹

Infection prevention and control have been shown to be dramatically effective in assuring the safety of both HCPs and patients. This is not limited to the use of personal protective equipment (PPE) but is also based on a risk stratification of patients, correct use of PPE, and interventions based on testing, separation, and isolation of patients at high risk of COVID-19. This has been demonstrated in countries with a high incidence of new cases such as Italy.¹⁰

However, the moment when to start taking special measures is not clear. The purpose of this study is to describe the rate of infection during the pandemic outbreak among personnel working at the endoscopy unit of the Hospital Clinic of Barcelona. The result will be compared with the infection rates in a COVID-19 hospitalization area and in a standard hospitalization zone.

The digestive endoscopy unit at the Hospital Clinic of Barcelona involves 9 full-time physicians, 16 nurses, 2 nurse assistants, 2 patient transporters, 4 administrative staff, and 2 cleaning workers. In 2019, 16,745 examinations were performed, of which 31.4% corresponded to high-complexity or interventional endoscopy.

On February 25, 2020, the first patient with COVID-19 was admitted to our hospital. We performed our regular endoscopy agenda without any special protection until March 13, despite the closure of schools on March 12 and the state of emergency declared by Spanish authorities on March 14. On Sunday, March 15, 124 patients had been admitted to the hospital because of SARS-CoV-2 pneumonia. Consequently, on March 16, we drastically reduced endoscopic activity from 400 explorations per week to 18 per week. Most of the elective procedures were canceled, and a triage protocol was adopted to select patients for whom the endoscopic procedure could not be delayed. Moreover, the staff was divided into teams that did not maintain contact within them. We also followed all the other recommendations regarding patient dress code and PPE. Because at that time the number of cases in Spain already exceeded 9000, we considered that all patients had at least an intermediate risk of infection.

During the following 2 weeks, the number of patients admitted to the hospital with COVID-19 pneumonia increased exponentially, and the gastroenterology department became a COVID facility, like most of the hospital departments. Only emergency endoscopy was performed under strict protection measures. In this period, 6 HCPs of our endoscopy unit (16.6%) presented with mild symptoms and received diagnoses with SARS-CoV-2 infection: 2 doctors, 1 nurse assistant, 1 administrative staff member, and the 2 patient transporters. On April 30, a systematic polymerase chain reaction test for SARS-CoV-2 was performed weekly for all HCPs at the Service of Gastroenterology (endoscopy unit and 2 hospitalization areas, 1 COVID-19 and 1 non-COVID-19). There were no more SARS-CoV-2 infections among HCPs of the endoscopy unit. Interestingly, among the 59 HCPs of a 24-bed COVID-19 unit, 8 became SARS-CoV-2 positive (13.5%) as compared with only 1 (7.7%) in a non-COVID-19 unit.

It is difficult to assess how many infected patients underwent an endoscopic procedure during that time because

SARS-CoV-2 tests were performed only for patients with a typical clinical picture or epidemiologic background. Therefore, patients' status related to the infection was unknown in most of the cases. Only 1 patient, who was admitted because of an accidental ingestion of caustic material and underwent exploration several times, had a positive result for SARS-CoV-2 testing 7 days after the last gastroscopy. One of the gastroscopies was performed by an endoscopist who became SARS-CoV-2 positive 1 week later.

Although it is not possible to know whether the HCPs were infected while working, the cluster of COVID-19 cases in the endoscopy unit at the beginning of the state of emergency, together with the lack of infections thereafter when PPE and other social protective measures were well established, supports the assumption that the infections were related to endoscopic techniques before the infection prevention protocol was settled. Moreover, on the basis of recent data showing that (1) 5% of the Spanish population currently has antibodies against SARS-CoV-2¹¹ and (2) 21.2% of HCPs have been infected,¹² we can assume that they were infected in the hospital. These results are in concordance with a very recent Italian multicenter study published by Repici et al,¹⁰ although in that study the rate of HCPs with positive test results for COVID-19 was much lower (4.3%), most of the infections occurred before the introduction of safety measures as well. On the other hand, even though we did not perform a comparative study, the similar rates of infection in the endoscopy unit and in a COVID-19 working area support the argument that endoscopic techniques are high-risk procedures.

In conclusion, our data support the efficacy of the described protective measures (use of PPE together with limitation of the activity and different groups of HCPs) to prevent SARS-CoV-2 infection in HCPs of the endoscopy units. According to this, we strongly recommend an early implementation of protective mechanisms to prevent COVID-19 among workers of endoscopy units.

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Abbreviations: COVID-19, coronavirus disease 2019; HCPs, health care providers; PPE, personal protective equipment; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

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