Impact of the COVID-19 pandemic on gastrointestinal endoscopy activity in France

Authors
Arthur Belle*1, Maximilien Barret*1,2, David Bernardini3, Anne-Laure Tarrerias4, Erwan Bories5, Vianna Costil6, Bernard Denis7, Rodica Gincul8, David Karsenti9, Stephane Koch10, Arthur Laquiere11, Thierry Lecomte12, Vincent Quentin13, Gabriel Rahmi14, Michel Robaszkiewicz15, Eric Vaillant16, Geoffroy Vanbiervliet17, Ariane Vienne18, Franck Dumeiran19, Olivier Gronier20, Stanislas Chaussade1,2, for the French Society of Digestive Endoscopy (Société Française d’Endoscopie Digestive)

Institutions
1 Gastroenterology and Digestive Oncology, Cochin Hospital, Assistance Publique-Hôpitaux de Paris, Paris, France
2 University of Paris, Paris, France
3 Gastroenterology Department, La Casamance Private Hospital, Aubagne, France
4 Gastroenterology Department, Hôpital Foch, Suresnes, Île-de-France, France
5 Gastroenterology Department, Hôpital Privé de Provence, Aix En Provence, France
6 Gastroenterology Department, Pôle Santé des 4 Temps, Puteaux, France
7 Médecine A, Hôpital Pasteur, Colmar, France
8 Service de Gastroentérologie, Hôpital Edouard Herriot, Lyon, France
9 Digestive Endoscopy Unit, Clinique de Paris-Bercy, Charenton-le-Pont, France
10 Gastroenterology Department, CHU Besançon, Besançon, France
11 Gastroenterology Department, Hôpital St Joseph, Marseille, France
12 Department of Hepatogastroenterology and Digestive Oncology, Trouseau University Hospital, Tours, France
13 Digestive Endoscopy Unit, Hôpital St Brieuc, St Brieuc, France
14 Gastroenterology and Digestive Endoscopy, Georges Pompidou European Hospital, Paris, France
15 Department of Gastrointestinal Endoscopy, CHRU de Brest, Brest, France
16 Department of Gastroenterology, Centre médical du Nord, Lille, France
17 Digestive Endoscopy, Hôpital de L’Archet 2, Nice, France
18 Department of Gastroenterology, Hôpital privé d’Anthony, Anthony, France
19 Gastroenterology Department, Société française d’endoscopie digestive, Limoges, France
20 Department of Gastroenterology and Hepatology, Clinique Sainte Barbe, Strasbourg, France

ABSTRACT
Background The SARS-CoV-2 pandemic has majorly affected medical activity around the world. We sought to measure the impact of the COVID-19 pandemic on gastrointestinal (GI) endoscopy activity in France.

Methods We performed a web-based survey, including 35 questions on the responders and their endoscopic practice, from 23 March to 27 March 2020, sent to the 3300 French gastroenterologists practicing endoscopy.

Results 694 GI endoscopists (21%) provided analyzable data; of these, 29.4% (204/694) were involved in the management of COVID-19 patients outside the endoscopy department. During the study period, 98.7% (685/694) of
endoscopists had had to cancel procedures. There were 89 gastroenterologists (12.8%) who reported symptoms compatible with COVID-19 infection, and a positive PCR test was recorded in 12/197 (6.1%) vs. 3/497 (0.6%) endoscopists in the high vs. low prevalence areas, respectively (P < 0.001).

Conclusions The COVID-19 pandemic led to a major reduction in the volume of GI endoscopies performed in France in March 2020. The prolonged limited access to GI endoscopy could lead to a delay in the management of patients with GI cancers.

Introduction

COVID-19 is thought to spread primarily through droplets of saliva, but airborne transmission and fecal excretion have been documented [1, 2]. Healthcare professionals in endoscopy are exposed to COVID-19 by the contact of saliva droplets with their face and airways, touch contamination, and contact with patient stools [3, 4]. Periendoscopic aerosolized infections have also been reported, placing upper gastrointestinal (GI) endoscopy among the major aerosol-generating procedures [5]. In addition, the high numbers of patients and accompanying persons visiting an endoscopy unit each day further increases the risk of contaminating the staff.

The French Society of Digestive Endoscopy (Société Française d’Endoscopie Digestive; SFED) and the European Society of Gastrointestinal Endoscopy (ESGE) had both published position statements by mid-April 2020 on the measures recommended to protect both patients and the endoscopy staff [3, 6]. However, COVID-19 eventually spread massively in France, reaching over 180,000 confirmed cases, including endoscopy patients and healthcare practitioners.

We sought to measure the impact of the COVID-19 pandemic on GI endoscopy activity in France and to determine the risk of contamination of endoscopists at the peak of the epidemic.

Methods

We performed a web-based survey using an online questionnaire hosted on the SFED website. This survey included 35 questions on the description of the responders and their endoscopic practice (Appendix 1, available in online online Sup-
Table 1 Impact of the COVID-19 pandemic on gastrointestinal endoscopy activity in France and comparison between the responses from those in the highest COVID-19 prevalence areas (North-East of France and Paris area) and those in the rest of the territory.

|                                          | Whole of France (n = 694) | Highest COVID-19 prevalence areas (n = 197) | Lowest COVID-19 prevalence areas (n = 497) | P value |
|-----------------------------------------|---------------------------|-----------------------------------------------|---------------------------------------------|---------|
| Hospital's emergency plan been triggered, n (%) | 547/608 (90.0)            | 163/172 (94.8)                                | 384/436 (88.1)                              | 0.02    |
| Hospital had admitted COVID-19 patients, n (%) | 505/604 (72.8)            | 156/197 (79.2)                                | 349/497 (70.2)                              | 0.02    |
| Involvement of the gastroenterologist in the management of COVID-19 patients, n (%) | 204/694 (29.4)            | 88/197 (44.7)                                 | 116/497 (23.3)                              | <0.001  |
| Consultations had been canceled, n (%) | 660/694 (95.1)            | 179/197 (90.9)                                | 481/497 (96.8)                              | 0.003   |
| Endoscopies had been canceled, n (%) | 685/694 (98.7)            | 193/197 (98.0)                                | 492/497 (99.0)                              | 0.30    |
| Endoscopy outpatient clinic closed, n (%) | 511/604 (73.6)            | 155/197 (78.7)                                | 356/497 (71.6)                              | 0.07    |
| Endoscopy procedures still possible for hospital inpatients, n (%) | 342/694 (49.3)            | 54/197 (27.4)                                 | 288/497 (58.0)                              | <0.001  |
| Endoscopy procedures still possible for standard emergencies, n (%) | 499/604 (79.9)            | 114/197 (57.9)                                | 385/497 (77.5)                              | <0.001  |
| Endoscopy procedures still possible for vital emergencies, n (%) | 662/604 (95.4)            | 183/197 (92.9)                                | 479/497 (96.4)                              | 0.07    |
| Endoscopy procedures performed for COVID-19 patients, n (%) | 65/604 (9.4)              | 35/197 (17.8)                                 | 30/497 (6.0)                                | <0.001  |
| Mean (SD) number of endoscopy procedures for COVID-19 patients | 2.3 (0.7)                 | 2.4 (0.5)                                     | 2.2 (0.8)                                   | 0.06    |
| Specific circuit for COVID-19 patients, n (%) | 305/604 (43.9)            | 75/197 (38.1)                                 | 230/497 (46.3)                              | 0.05    |
| Anesthesiologists or specialist nurses requisitioned, n (%) | 497/604 (71.6)            | 162/197 (82.2)                                | 335/497 (67.4)                              | <0.001  |
| Mechanical ventilators requisitioned, n (%) | 342/604 (49.3)            | 122/197 (61.9)                                | 220/497 (44.3)                              | <0.001  |
| Other materials from the endoscopy department requisitioned, n (%) | 136/604 (19.6)            | 64/197 (32.5)                                 | 72/497 (14.5)                               | <0.001  |
| Endoscopy staff requisitioned for care of COVID-19 patients, n (%) | 454/604 (65.4)            | 156/197 (79.2)                                | 298/497 (60.0)                              | <0.001  |

SD, standard deviation.

Results

Characteristics of the responders

There were 694 GI endoscopists (21.0 % of the 3300 gastroenterologists practicing endoscopy in France) who responded to the survey and provided analyzable data. The mean age of the study participants was 50.3 years, and 26.5 % were 60 or older; 65 % were men and 67 % worked in a private hospital. Of the responders, 37.1 % (258/694) worked in regions with a high COVID-19 prevalence (Hauts de France, Grand-Est, Bourgogne-Franche-Comté, Île de France). The regions of activity of all responders are shown in Fig. 1.

Consequences for gastroenterology and endoscopy practice

There were 547 responders (90.0 %) who reported that an emergency plan had been activated in their hospital, and 72.8 % (505/694) had specific departments for COVID-19 patients in their center, with a mean of 54.5 % of the beds requisitioned for COVID-19 patients. Mechanical ventilators and endoscopy staff had been requisitioned in 49.3 % and 65.4 % of centers, respectively. The majority of gastroenterologists participated in healthcare activities related to the COVID-19 pandemic: 15.3 % (106/694) performed telephone consultation or triage of COVID-19 patients; 37.3 % (259/694) did on-call duty outside the emergency department; 23.6 % (164/694) did on-call duty in the emergency department;
Endoscopic procedures performed without a mask, n (%) 394/694 (56.8) 114/197 (57.9) 280/497 (56.3) 0.70
Difficulty obtaining surgical masks for endoscopy, n (%) 97/694 (14.0) 23/197 (11.7) 74/497 (14.9) 0.30
Difficulty obtaining FFP2 masks for endoscopy, n (%) 378/694 (54.5) 104/197 (52.8) 274/497 (55.1) 0.60
Difficulty obtaining eye protections for endoscopy, n (%) 173/694 (24.9) 31/197 (15.7) 142/497 (28.6) 0.004
Difficulty obtaining gowns for endoscopy, n (%) 131/694 (18.9) 32/197 (16.2) 99/497 (19.9) 0.30
Difficulty obtaining gloves for endoscopy, n (%) 10/694 (1.4) 1/197 (0.5) 9/497 (1.8) 0.30
Difficulty obtaining surgical cap for endoscopy, n (%) 19/694 (2.7) 5/197 (2.5) 14/497 (2.8) >0.99
Difficulty obtaining hydroalcoholic gel for endoscopy, n (%) 13/694 (1.9) 5/197 (2.5) 8/497 (1.6) 0.50
Gastroenterologist had COVID-19 symptoms, n (%) 89/694 (12.8) 42/197 (21.3) 47/497 (9.5) <0.001
COVID-19 infection documented by a positive PCR, n (%) 15/694 (2.1) 12/197 (6.1) 3/497 (0.6) <0.001

Symptoms compatible with COVID-19 infection were reported by 12.8 % (89/694) of the gastroenterologists; of these, 37.1 % (33/89) had a PCR test for COVID-19 performed, a mean of 6 days after the onset of symptoms, and the test was positive in 45.5 % (15/33) of the tests. One responder had required hospital admission. Of those reporting symptoms, 43.8 % (39/89) believed they had been contaminated at work.

▶ Table 1 and ▶ Table 2 show the comparative impact of the COVID-19 pandemic on GI endoscopy in France, and compare the highest prevalence areas (North-East of France and Paris area) with the rest of France.

Discussion

We conducted a survey among all French gastroenterologists practicing endoscopy, in a period of intense viral circulation in France, after there had been over 20 000 documented COVID-19 cases and before the effects of the lockdown (instituted on 17 March 2020) were observable. The 694 responders, accounting for 21 % of the 3300 gastroenterologists in France, likely include a large proportion of the 806 active members of the French Society of Digestive Endoscopy registered for the year 2019.

Our data illustrate the major impact of the pandemic on GI endoscopy activity in France, with a 91.2 % reduction in procedure numbers. This reduction was the consequence of the requisition of the anesthesiology teams and their equipment, decided by the Ministry of Health, explaining why the endoscopy activity reduction affected equally the areas with high or low COVID-19 prevalence. Indeed, in France, over 90 % of colonoscopies are performed with the patient under general anesthesia by an anesthesiologist or a specialist nurse [7]. While endoscopies for vital emergencies were still possible in virtually all cases, endoscopies for most emergencies and for inpatients were reported as being impossible by 28.1 % and 50.7 % of re-
sponders, respectively, with significant disparities over the territory.

We documented a 12.8% prevalence of COVID-19 symptoms among GI endoscopists, significantly higher in the areas with higher COVID-19 prevalence. Of note, the difficulty accessing diagnostic tests in France at this time explains why only a third of the gastroenterologists who were symptomatic had a PCR test performed. Our infection rate is higher than the 4.3% (confirmed) infection rate reported in Northern Italy [4], and is possibly explained by a high involvement of the gastroenterologists in the management of COVID-19 patients, and the use of personal protective equipment (PPE), such as masks, by less than half of the endoscopists. This last point could result both from a lack of awareness of the importance of wearing a mask when performing endoscopy procedures, and a lack of optimal PPE (e.g. FFP2 masks) in over half of the endoscopy departments.

Eventually, lockdown on 17 March resulted in a decrease in the number of COVID-19 patients from 16 April, and the lockdown was stopped on 11 May 2020. However, the current endoscopy activity in France still does not exceed 80% of the actual capacity, because many anesthesiologists are still managing COVID-19 units, many patients are not willing to come to the hospital for non-emergent investigations, and protective measures limit the number of patients in the endoscopy outpatient clinics. Therefore, thousands of endoscopy procedures cancelled during the lockdown have still not been rescheduled. In the meantime, the improved knowledge about the virus, the first severe cases among endoscopists, and the improved availability of PPE, including FFP2 masks, seems to have resulted in an increased adherence to protective measures among endoscopists.

The limitations of our work include the limited number of responders, with an over-representation of private practitioners, and possible bias toward the limitation of endoscopy activity (because most public hospitals were able to maintain a minimal endoscopy activity throughout the epidemic). Second, only a small proportion of the responders with symptoms had diagnostic confirmation by PCR, and severe cases may have been overlooked because they would have been unable to take the survey. Finally, the short duration of the study period and the relative early phase in the pandemic may also lead to underestimation of certain events, such as the contamination rate of endoscopists or the difficulties in obtaining certain types of PPE.

In conclusion, we observed a 91.2% reduction of GI endoscopy activity at the end of March 2020, resulting from the COVID-19 pandemic and the decisions of the healthcare authorities. While emergent endoscopies were still possible, even in the areas with the highest COVID-19 prevalence, the prolonged limited access to GI endoscopy could lead to a delay in the management of thousands of patients with GI cancers.

Competing interests

The authors declare that they have no conflict of interest.

References

[1] Tian Y, Rong L, Nian W et al. Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission. Aliment Pharmacol Ther 2020; 51: 843–851
[2] Wilson NM, Norton A, Young FP et al. Airborne transmission of severe acute respiratory syndrome coronavirus-2 to healthcare workers: a narrative review. Anaesthesia 2020: doi:10.1111/anae.15093
[3] Gralnek IM, Hassan C, Beilenhoff U et al. ESGE and ESGENA Position Statement on gastrointestinal endoscopy and the COVID-19 pandemic. Endoscopy 2020; 52: 483–490
[4] Repici A, Aragona G, Cengia G. Low risk of covid-19 transmission in GI endoscopy. Gut 2020: doi:10.1136/gutjnl-2020-321341
[5] Parodi SM, Liu VX. From containment to mitigation of COVID-19 in the US. JAMA 2020: doi:10.1001/jama.2020.3882
[6] SFED. Épidémie de COVID-19 – Recommandations en endoscopie digestive. 11.03 2020: https://www.sfed.org/files/files/covid19en-do_reco.pdf Accessed: 29 June 2020
[7] Barret M, Boustiere C, Canard J-M et al. Factors associated with adenoma detection rate and diagnosis of polyps and colorectal cancer during colonoscopy in France: results of a prospective, nationwide survey. PloS One 2013; 8: e68947