ORIGINAL ARTICLE

AG-2020-264
doi.org/10.1590/S0004-2803.202100000-57

COVID-19 and digestive endoscopy: emergency endoscopic procedures and risk factors for upper gastrointestinal bleeding

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Received: 21 December 2020
Accepted: 15 February 2021

ABSTRACT – **Background** – The COVID-19 pandemic has changed digestive endoscopy services around the world. **Objective** – This study aimed to measure the number of urgent/emergency endoscopic procedures performed in a Brazilian hospital, comparing it to the same period in the previous year, and to identify risk factors in COVID-19 patients undergoing endoscopic procedures for upper gastrointestinal bleeding (UGIB). **Methods** – This was a retrospective, cross-sectional, observational, single-center study. The study evaluated urgent/emergency endoscopic procedures performed on adult patients from March to August in 2019 and 2020. The COVID-19 patients included were diagnosed using RT-PCR, aged over 18 years with complete medical record information. The variables evaluated were age, sex, comorbidities, length of stay, D-dimer, need for intensive care unit (ICU) and mechanical ventilation. Student's *t*-test for independent samples or the non-parametric Mann-Whitney test was used to compare quantitative variables. Categorical variables were analyzed using Fisher's exact test. A *P*-value <0.05 indicated statistical significance. **Results** – A total of 130 urgent/emergency endoscopic procedures were performed in 2020 and 97 in 2019. During the study period, 631 patients were hospitalized due to COVID-19, of whom 16 underwent urgent/emergency endoscopic procedures, 10 (1.6%) due to UGIB. Of the variables analyzed, the need for ICU and/or mechanical ventilation during hospitalization was statistically significant as a risk factor for UGIB. **Conclusion** – This study showed increased urgent/emergency endoscopic procedures during the pandemic at the study site. Among the patients hospitalized with the novel coronavirus, there is a higher risk for UGIB in those needing ICU and/or mechanical ventilation.

Keywords – Gastrointestinal endoscopy; gastrointestinal bleeding; COVID-19.

INTRODUCTION

The spread of coronavirus disease (COVID-19), which is caused by a severe acute respiratory syndrome coronavirus 2 (SARS-CoV2), has impacted the world since December 2019. COVID-19 typically presents as a respiratory disease; however, it may present with gastrointestinal symptoms[1]. In a single-center cohort study conducted in hospital for COVID-19 patients in São Paulo, Brazil, 33.25% of patients reported at least one gastrointestinal symptom[2]. The disease is mild in most patients, but in some cases it progresses to severe pneumonia, acute respiratory distress syndrome, and multiple organ failure[3]. Previous studies have shown increased D-dimer levels in patients more severely affected by the disease, indicating a greater risk of death[4].

Since the onset of the pandemic, hospital service routines have changed significantly[5]. These changes have also affected digestive endoscopy services around the world, resulting in a decrease in the number of elective procedures performed. In addition to the need to reallocate teams and resources to meet this new demand, COVID-19 presents challenges in performing digestive endoscopy, as endoscopy is a potentially aerosol-generating procedure and is associated with a high risk of SARS-CoV-2 transmission[3, 5-7].

An Italian multicenter study also showed significant changes in the demand for emergency endoscopies during the COVID-19 pandemic, with a decreased number of emergency endoscopies and colonoscopies compared to the previous year[3]. The digestive endoscopy service of the Clinical Hospital Complex of the Federal University of Paraná (CHC–UFPR), which performs on average 5,000 endoscopic procedures per year, had all elective endoscopic procedures postponed since the beginning of the community transmission of the virus in the city of Curitiba, PR, Brazil. However, all urgent/emergency procedures were maintained for both SARS-CoV-2 negative and positive patients, in addition to procedures considered high priority according to the guidelines of the Brazilian Society of Digestive Endoscopy (SOBED), consistent with the guidelines of other international institutions, such as the American Society for Gastrointestinal Endoscopy (ASGE) and the European Society of Gastrointestinal Society (ESGE)[8-10]. Regarding digestive endoscopy in the context of the COVID-19 pandemic, it has been questioned if SARS-CoV-2 infection is associated with upper gastrointestinal bleeding (UGIB). Yang et al. reported a 4% incidence of gastrointestinal bleeding in critically ill COVID-19 patients in Wuhan, China[11]. Another study conducted in Italy reported a prevalence of 5.2% in patients hospitalized in an internal medicine ward, with the most frequent endoscopic finding being gastric or duodenal ulcers[12].

Declared conflict of interest of all authors: none
Disclosure of funding: no funding received
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Thus, the primary objective of this study was to assess whether there was a change in the number of urgent and emergency endoscopic procedures performed by our endoscopy service during the coronavirus pandemic period, comparing to the same period in 2019. A secondary objective, was to determine whether there is a risk factor for UGIB and need of endoscopic procedure among patients admitted with COVID-19.

METHODS

Study design

This was a retrospective, cross-sectional, observational, single-center study using data from the Digestive Endoscopy Service of the CHC–UFPR, a Brazilian public tertiary university hospital.

In order to determine the primary outcome, we collected data on the number of urgent and emergency endoscopic procedures during the pandemic and the comparison period, including all urgent and emergency endoscopic procedures performed on patients aged >18 years from March to August in 2019 and 2020, according to the report system.

The procedures were categorized as upper gastrointestinal endoscopy (UGIE), colonoscopy, flexible sigmoidoscopy, or endoscopic retrograde cholangiopancreatography (ERCP).

The data were evaluated according to the absolute numbers.

In order to determine the secondary outcome, we collected data on risk factors for UGIB among patients hospitalized with COVID-19. In our study we assumed that individuals who needed to be hospitalized for COVID19 had moderately severe disease, and that those who were admitted to a critical care unit, with or without the necessity for mechanical ventilation, had severe disease.

The study was approved by the local Ethics Committee (number 37910620.8.0000.0096).

Endoscopic procedures in hospitalized COVID-19 patients

We analyzed endoscopic procedures performed on COVID-19 patients hospitalized over a six-month period, from March to August 2020, at the digestive endoscopy service of the CHC-UFPR. The sample included patients aged over 18 years hospitalized for COVID-19 diagnosed using the XPERT® XPRESS SARS-CoV-2 or the BIOMOL OneStep / COVID-19 real-time polymerase chain reaction (RT-PCR) kits.

The medical records were evaluated for information on age, sex, comorbidities, length of stay, laboratory tests, and endoscopic procedures (UGIE, colonoscopy, flexible sigmoidoscopy, or ERCP). It is important to note that the endoscopic procedures were performed only in cases classified as urgency/emergency according to international guidelines and to a protocol developed by the SOBED, ASGE and ESGE[8-10].

Patients aged over 18 years who underwent UGIE to investigate UGIB, hospitalized with the new coronavirus, and had complete information on comorbidities and D-dimers in their medical charts were included in the study to compare the risks for patients undergoing UGIE to investigate UGIB. Children under 18 years of age were excluded, because our hospital did not admit children with COVID-19. In addition, patients who had incomplete medical record information, those who were still hospitalized during data collection, and pregnant women were excluded, in this last case due to potential bias in laboratory data on inflammatory markers, such as D-dimer.

The comorbidities were categorized as systemic arterial hypertension (SAH), diabetes mellitus (DM), coronary artery disease (CAD), congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), human immunodeficiency virus (HIV) positive, undergoing immunosuppressive treatment, chronic kidney disease (CKD), chronic liver disease, neoplasia, and other comorbidities.

Differences were also assessed according to length of stay, D-dimer value at hospital admission, need to stay in the intensive care unit (ICU) during hospitalization, and need for mechanical ventilation (MV).

The results obtained in the study are presented as means, standard deviations, medians, minimum and maximum values (for quantitative variables), or frequencies and percentages (for categorical variables). To compare the groups defined by UGIE (yes or no) for quantitative variables, the Student's *t*-test for independent samples or the non-parametric Mann-Whitney test was used. Fisher's exact test was used for categorical variables. The normality of the variables was evaluated using the Kolmogorov–Smirnov test. A *P*-value <0.05 indicated statistical significance. The data were analyzed using Stata/SE v.14.1 software (StataCorp LP, College Station, TX, USA).

RESULTS

Comparison of endoscopic procedure numbers during COVID-19 pandemic

Between March and August of 2020, during COVID-19 pandemic, 130 emergency/urgent endoscopic procedures were performed, compared to 97 during the same period in 2019, before the start of the COVID-19 pandemic. Four procedures in 2019 and nine procedures in 2020 were excluded from the analyses because they were performed in children under 18 years old.

In 2019, patients had a mean age of 59±15.3 years (range: 19–84 years) and 57 (59%) were male, while in 2020, patients had a mean age of 61±16.4 years (range: 19–96 years) years and 73 (56%) were male.

TABLE 1 shows the emergency/urgent procedures with the indications and the number of patients who received endoscopic therapy. Among the patients who needed endoscopy for upper gastrointestinal bleeding, 19 (26%) and 20 (22%) needed endoscopic therapy in 2019 and 2020, respectively.

TABLE 2 shows the main abnormalities found on endoscopy. Of the patients who underwent UGIE, 27 (35%) and 22 (21%) had more than one lesion discovered in 2019 and 2020, respectively.

TABLE 3 shows the endoscopic treatment that was needed.

Endoscopic procedures in hospitalized COVID-19 patients

From March to August 2020, 631 patients were admitted to the CHC–UFPR due to COVID-19, with a mean age of 56.75±15.31 years (18–94 years); 54.2% (342) were men. The mean length of hospital stay was 11.14±11.27 days (0–85 days). Of these patients, 142 died (mortality rate of 22.5%), and 11 remained hospitalized until the end of the study data collection period.

Of the hospitalized patients, 43.42% (274) needed to stay in the ICU for some period, and 31.5% (199) required MV.

D-dimer values were obtained in 568 patients, with a mean value of 28.12±35.83 mg fibrinogen equivalent units (FEU)/L (0–108.2 mg FEU/L) (positive reference value >0.55 mg FEU/L).

From March to August 2020, 19 emergency endoscopic procedures were performed on 16 patients with COVID-19, 2.5% of the patients hospitalized in the period. Of these, 16 underwent

TABLE 1. Indications for urgent and emergency endoscopic examinations among inpatients at the Clinical Hospital Complex of the Federal University of Paraná from March to August in 2019 and 2020 and number of endoscopic treatments needed.

Endoscopic procedure and indication	2019		2020	
	Number of endoscopic procedures	Endoscopic treatment n (%)	Number of endoscopic procedures	Endoscopic treatment n (%)
UGIE				
Hematemesis	29	11 (39.28)	32	11 (34.37)
Melena	27	6 (22.22)	41	9 (21.95)
Hematochezia	1	1 (100)	4	0 (0.00)
Hemoglobin 2 points drop without exteriorization	17	1 (5.88)	14	0 (0.00)
Feeding path	1	1 (100)	14	12 (85.71)
Gastrointestinal obstruction/pyloric syndrome	1	0 (0.00)	1	1 (100)
Other	1	1 (100)	0	0 (0.00)
Colonoscopy				
Hematochezia	4	0 (0.00)	6	0 (0.00)
Hemoglobin 2 points drop without exteriorization	1	0 (0.00)	1	0 (0.00)
Gastrointestinal obstruction/sigmoid volvo	3	2 (66.67)	2	1 (50.00)
Retossigmoidoscopy				
Hematochezia	3	1 (33.33)	0	0
ERCP				
Cholangitis	9	9 (100)	15	12 (80.00)
Total	97	33 (34.02)	130	46 (35.38)

UGIE: upper gastrointestinal endoscopy; ERCP: endoscopic retrograde cholangiopancreatography.

UGIE, two underwent colonoscopy, and two underwent ERCP. The indications for the procedures are shown in TABLE 4. Of the patients who underwent UGIE, 10 (1.6% of hospitalized patients) had UGIE to investigate UGIB.

A total of nine cases were included to analyze UGIE to investigate UGIB, because in one case there were no completed information in the medical records. The findings are shown in TABLE 5. In all cases, the indication was melena and hemoglobin was decreased in at least two points. Only two patients required endoscopic treatment, one with hemostatic clip placement, and one with hemostatic clip placement and adrenalin injection.

For the comparison of COVID-19 patient who did and did not undergo UGIB, we excluded 83 patients, of whom 9 were pregnant women, 11 were patients still hospitalized at the end of data collection period, and 63 had incomplete information in their medical records. TABLE 6 shows the correlation of age, length of stay, comorbidities, and need for MV and ICU.

DISCUSSION

In the period from March to August 2020, there was an increased number of urgent/emergency endoscopic procedures in the study center compared to the same period in 2019, a result that differs from most studies published so far, which showed a decreased or similar number[3,5,13,14]. The procedures followed the SOBED, ASGE and ESGE recommendations and involved patients with gastrointestinal bleeding, foreign body ingestion, and bile duct obstruction. The explanation for this increased number of urgent/emergency procedures is unknown, but it may be related to the greater need for endoscopic procedures in hospitalized patients with conditions unrelated to COVID-19. Some patients who already had an indication for elective endoscopic procedures, which were postponed due to the pandemic, may have been hospitalized due to the worsening of their basic condition, such as patients with suspected malignancy. This can also explain the increase in the number of urgent endoscopic retrograde cholangiopancreatography procedures, as this procedure was not performed electively in most of the regional hospitals.

Another factor that contributed to our findings was the increase in the number of ICU beds. In our hospital, for example, there were 54 ICU beds before the onset of the COVID19 pandemic, and 30 new ICU beds were added after the start of the pandemic, increasing the ICU capacity by 56%. As a result, the hospital inpatient profile changed, and the number of critically ill patients increased. UGIE is a common diagnostic and therapeutic procedure in patients admitted to the ICU, especially in those who require an assessment of bleeding or placement of feeding tubes[15]. Among the indications for urgent/emergency procedures, procedures for the investigation of melena and the placement of feeding tubes increased, in keeping with procedures required by critical care patients. However, the percentage of patients undergoing endoscopy who required endoscopic treatment did not change.

In 2020, the number of endoscopic procedures related to ICU stress, such as ulcers and ischemia, increased. However, the number of endoscopic examinations without any abnormalities detected also increased, probably because of the increase in the number of examinations for the placement of feeding tubes. In a previous study, the main findings in patients undergoing endoscopy in intensive care units for gastrointestinal bleeding were peptic ulcer disease (56%), esophagitis (39%) and erosive gastritis (17%)[16].

The number of procedures with the finding of esophageal varices decreased. This can be attributed to changes in infection control measures and elective examination protocols during the period of March and August, 2020. The protocol for eradicating esophageal varices in cirrhotic patients changed and these patients were managed with elective UGIE.

Of the COVID-19 patients hospitalized in the study center, 19 underwent endoscopic procedures in the evaluated period, ten to

TABLE 2. Main endoscopic findings among inpatients at the Clinical Hospital Complex of the Federal University of Paraná who underwent urgent and emergency endoscopic examinations from March to August in 2019 and 2020.

Endoscopic alterations	2019 (n)	2020 (n)
UGIE		
Esophagus		
Esophageal varices	24	17
Esophageal laceration	7	0
Esophageal candidiasis	1	1
Stomach		
Gastric ulcer Sakita H and S	17	7
Sakita A1	13	22
Forrest	–	–
IA	0	1
IB	2	1
IIA	0	1
IIB	1	0
IIC	4	4
III	7	15
Angiectasis	3	3
Gastric ischemia	1	4
Gastric laceration	6	0
Hemorragic gastritis	4	0
Gastric varices	8	4
Portal hypertensive gastropathy	14	16
Duodenum		
Duodenal ulcer Sakita H and S	0	1
Sakita A1	0	15
Forrest		
IA	0	1
IB	0	1
IIA	0	0
IIB	0	1
IIC	0	3
III	0	9
Miscellaneous		
Neoplasia	0	8
Others	6	3
None	5	13
Colonoscopy		
Angiectasis	0	1
Hemorrhoids	1	1
Polyps	0	2
Diverticulosis	0	2
Colitis	0	1
Neoplasia	1	0
After polypectomy bleeding	1	0
None	5	5
Retossigmoidoscopy		
Rectal ulcers	1	0
After polypectomy bleeding	1	0
None	1	0
ERCP		
Choledocolithiasis	7	10
Choledoco stenosis	0	4
Pancreatic cancer	2	1

UGIE: upper gastrointestinal endoscopy; ERPC: endoscopic retrograde cholangiopancreatography.

TABLE 3. Endoscopic treatment of inpatients who underwent urgent or emergency endoscopic examinations at the Clinical Hospital Complex of the Federal University of Paraná from March to August in 2019 and 2020.

Endoscopic treatments	2019 (n)	2020 (n)
UGIE		
Ligation of esophageal varices	8	9
Adrenalin injection	4	2
Hemostatic clip and adrenalin injection	2	2
Argon plasma	1	0
Cyanoacrylate injection	1	1
NFT positioning	1	12
Varicose sclerosis	1	0
Sengstaken-Blakemore positioning	2	0
Varicose sclerosis and ligation of esophageal varices	0	1
Hemostatic clip, adrenalin and absolute alcohol injection	0	3
Hemostatic clip	0	2
Colonoscopy		
Polypectomy	–	3
Volvulus reserval	2	1
Retossigmoidoscopy		
Hemostatic clip and adrenalin injection	1	–
ERCP		
Papilotomy and stone extraction	7	8
Choledochal prosthesis placement	1	4
Stenosis dilatation	1	0

UGIE: upper gastrointestinal endoscopy; ERCP: endoscopic retrograde cholangiopancreatography; NFT: nasoenteral feeding tube.

TABLE 4. Indications for urgent and emergency endoscopic examinations among COVID-19 inpatients at the Clinical Hospital Complex of the Federal University of Paraná from March to August of 2020.

Endoscopic procedure and indication	
UGIE	
Melena	10
Hemoglobin 2 points drop without exteriorization	3
Feeding path	2
Colonoscopy	
Hemoglobin 2 points drop without exteriorization	2
ERCP	
Colangitis	2

UGIE: upper gastrointestinal endoscopy; ERCP: endoscopic retrograde cholangiopancreatography.

TABLE 5. Endoscopic UGIE findings in hospitalized COVID-19 patients with UGIB.

Endoscopic findings	n
Gastric ischemia	2
Esophageal erosions/NFT trauma	1
Gastric laceration	1
Esophageal candidiasis	1
Enanthematous endoscopic gastritis	1
Sakita A1/Forrest IIb duodenal ulcer and erosive endoscopic gastritis	1
Others	1
Normal	1

UGIE: upper gastrointestinal endoscopy; UGIB: upper gastrointestinal bleeding; NFT: nasoenteral feeding tube.

TABLE 6. Comparison of demographic data and comorbidities of hospitalized COVID-19 patients who underwent UGIE to investigate UGIB.

Variable	UGIB		*P**
	No (n=539)	Yes (n=9)	
Age (years)	57±15.1	58±10.2	0.841
Sex			
Female	243 (45.1%)	4 (44.4%)	
Male	296 (54.9%)	5 (55.6%)	1
Length of hospitalization (days)	8 (0–85)	21 (3–48)	0.095
D-dimer on admission	1 (0–108.2)	1.9 (0.3–39.8)	0.362
Comorbidities			
SAH	264 (49.0%)	5 (55.6%)	0.748
DM	159 (29.5%)	2 (22.2%)	1
CAD	38 (7.1%)	0 (0%)	1
CHF	31 (5.8%)	2 (22.2%)	0.097
COPD	25 (4.6%)	1 (11.1%)	0.356
HIV	9 (1.7%)	0 (0%)	1
Immunosuppressed	18 (3.3%)	1 (11.1%)	0.274
CKD	16 (3%)	1 (11.1%)	0.249
Chronic liver disease	3 (0.6%)	0 (0%)	1
Neoplasia	17 (3.2%)	0 (0%)	1
Others	217 (40.3%)	4 (44.4%)	1
ICU during hospitalization	235 (43.6%)	8 (88.9%)	0.013
MV during hospitalization	168 (31.2%)	7 (77.8%)	0.006
Outcome			
Discharge	414 (76.8%)	5 (55.6%)	
Death	125 (23.2%)	4 (44.4%)	0.225

UGIE: upper gastrointestinal endoscopy; UGIB: upper gastrointestinal bleeding; SAH: systemic arterial hypertension; DM: diabetes mellitus; CAD: coronary artery disease; CHF: congestive heart failure; COPD: chronic obstructive pulmonary disease; CKD: chronic kidney disease; ICU: intensive care unit; MV: mechanical ventilation. *Student's *t*-test for independent samples (age); Mann-Whitney non-parametric test (time and D-dimer); Fisher's exact test (categorical variables), $P<0.05$.

investigate UGIB (1.6%). The clinical spectrum of gastrointestinal presentations and the risk of gastrointestinal bleeding in these patients are not yet fully understood. Previous studies reported a frequency ranging between 4% and 13.7%, predominantly in patients with more severe disease[4,12,17]. This risk may also be greater in older patients with multiple comorbidities[4,12,17], but in our study, we did not find a statistically significant association between age and the most prevalent comorbidities.

It has been hypothesized that in COVID-19 patients, prolonged hypoxia leads to tissue injury and necrosis, culminating in ulceration and bleeding[4,17]. There is limited information available on the most frequent endoscopic findings in COVID-19 patients with gastrointestinal bleeding. In a series of five cases, peptic ulcer was the most common finding[12]. Possible pathogenic mechanisms that could explain the increase in the occurrence of peptic ulcers include stress resulting from the acute disease, treatments that include corticosteroids, direct gastric epithelial damage caused by SARS-CoV-2, and active mucosal inflammation due to the cytokine storm[12,17].

Even though there were only nine cases of UGIB in our study, they highlight the great variability of endoscopic findings in patients with UGIB, with a slight predominance of findings related to ischemia of the gastrointestinal tract mucosa. Endoscopic treatment was necessary in only two of the cases, raising questions about the possibility of conservative treatment in these patients, as already reported in another study, due to the risk of transmission involved in the procedure[1]. In another Brazilian study of all patients admitted to the endoscopic unit with upper gastrointestinal bleeding, endoscopic treatment was performed in 24% of the patients[18]. We found a similar proportion requiring endoscopic treatment among the COVID-19 patients who presented with gastrointestinal bleeding in our study.

Coagulopathy is also common in these patients and seems to be an important prognostic factor. It results from the concomitant activation of the coagulation and fibrinolytic systems, related to a severe inflammatory state (cytokine storm) and/or viral sepsis, which sometimes leads to the use of clotting factors and decreased platelet count, resulting in thrombohemorrhagic events. A meta-analysis showed that increased D-dimer levels are associated with worse clinical progression in these patients[19]. Thromboprophylaxis is an important element of the management of COVID-19 patients, and the relatively high risk of gastrointestinal bleeding should be a point of attention for clinicians, with the requirement to monitor laboratory parameters and hemodynamic stability[12]. However, the present study showed no correlation between the D-dimer levels on patient admission and the UGIB event.

Of the patients admitted due to COVID-19 during the study period, the only factors significantly related to the occurrence of UGIB and the need for digestive endoscopy were the need for ICU admission and the need for MV. Age, sex, comorbidities, and D-dimer levels were not associated with the occurrence of digestive bleeding in these patients. There is one study in current literature, with 41 cases of UGIB in patients with COVID-19, and it showed that there seemed to be no difference in initial presenting symptoms or other potential risk factors, such as ICU admission, anticoagulation and nasogastric tube[20].

Gastrointestinal bleeding is a well-recognized complication in critically ill patients in an intensive care setting. A recent meta-analysis found the presence of kidney injury, coagulopathy, shock, and chronic liver disease as predictors of its occurrence, factors that were not separately categorized in ICU patients in the present study[21]. Mechanical ventilation can influence systemic hemodynamics by decreasing venous return and reducing preload, resulting in reduced cardiac output and splanchnic hypoperfusion, contributing to stress-related mucosal damage[22]. In contrast, a previously published meta-analysis showed no clear data on MV as a risk factor for UGIB in ICU patients, unlike the data presented in the present study[21]. Medications such as opiates and sedatives, administered to patients in the ICU, can also have deleterious effects on gastrointestinal function, including decreased gut motility and impaired venous return, and treatment with vasopressors can result in hypotension[22]. In addition, anticoagulant therapy is an important risk factor for nosocomial UGIB[23].

The limitations of this study are related to the retrospective and monocentric study design. We also had a small sample size and did not analyze the effect of the use of medications such as anticoagu-

lants and proton pump inhibitors. However, because COVID-19 is an endemic disease that has affected the whole world, the data and analyses reported are important for future prospective decisions and studies, such as a multicenter trial and comparison of UGIB in patients with and without COVID-19.

This study shows that the number of urgent/emergency endoscopic procedures conducted during the COVID-19 pandemic period is peculiar to each context, and there is currently no consensus on the number of procedures increasing or decreasing. The population profile for hospital admission should also be considered.

Our study findings suggest that patients with COVID-19 may have a higher risk of UGIB if they are in a critical condition and require ICU admission and/or advanced MV support. However, we cannot conclude whether the increased risk of UGIB among COVID-19 patients is attributable to the disease alone, because this was not our study focus. Thus, hospitals around the world, in which most admissions are due to the new coronavirus, could better plan their services.

ACKNOWLEDGMENTS

Bruno Verschoor, Eduardo Aimoré Bonin, Fernanda Bizinelli de Camargo, Kelly Cristina Vieira, Juliano Vanz, Márcio Batista, Renata Brandalise, who are part of the Endoscopy team fighting against COVID-19, and our group of Epidemiologists.

Authors' contribution

Rosevics L and Fossati BS: designed the research study, performed the research and wrote the paper. Teixeira S, Bem RS and Souza RCA: designed the research study and wrote the paper.

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Rosevics L, Fossati BS, Teixeira S, Bem RS, Souza RCA. COVID-19 e endoscopia digestiva: exames endoscópicos de urgência e fatores de risco para hemorragia digestiva alta. Arq Gastroenterol. 2021;58(3):337-43.

RESUMO – **Contexto** – A pandemia da COVID-19 tem alterado o funcionamento de serviços de endoscopia digestiva pelo mundo. **Objetivo** – O presente estudo tem por objetivo medir o número de exames endoscópicos de urgência/emergência realizados em um hospital público brasileiro, comparando-o ao mesmo período do ano anterior, além de avaliar os fatores de risco dos pacientes com COVID-19 que realizaram exame endoscópico por hemorragia digestiva alta (HDA). **Métodos** – Estudo retrospectivo, transversal, observacional e unicêntrico. Foram avaliados todos os exames endoscópicos de urgência/emergência realizados em pacientes acima de 18 anos, nos períodos de março a agosto dos anos de 2019 e 2020. Os pacientes com COVID-19 incluídos foram diagnosticados por RT-PCR, acima de 18 anos, com informações completas em prontuário. As variáveis avaliadas foram: tipo de exame endoscópico, idade, sexo, comorbidades, tempo de internação, d-dímero, necessidade de UTI e ventilação mecânica durante a internação. A comparação dos grupos em relação a variáveis quantitativas foi feita através do teste *t* de Student para amostras independentes ou o teste não-paramétrico de Mann-Whitney. As variáveis categóricas foram avaliadas pelo teste exato de Fisher. Valores de $P<0,05$ indicaram significância estatística. **Resultados** – Observaram-se 130 exames endoscópicos de urgência/emergência no período avaliado em 2020, e 97 em 2019. No período do estudo foram internados 631 pacientes por COVID-19, dos quais 16 realizaram exame endoscópico de urgência/emergência, sendo 1,6% por HDA. Dentre as variáveis analisadas, necessidade de UTI e/ou ventilação mecânica durante o internamento foram estatisticamente significativos como risco para desenvolvimento de HDA. **Conclusão** – O presente estudo mostra que para a realidade local houve incremento de exames endoscópicos de urgência/emergência durante a pandemia. Dentre os pacientes internados com o novo coronavírus, há maior risco de HDA naqueles que necessitam de UTI e/ou ventilação mecânica.

Palavras-chave – Endoscopia digestiva; hemorragia digestiva; COVID-19.

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