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Dear Editor,

Coronavirus disease-2019 (COVID-19) is a global pandemic caused by Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). Although it is primarily a respiratory illness, gastrointestinal involvement is increasingly being observed, such as anorexia (26.8%), nausea/vomiting (7.8%), diarrhea (5–10%) and abdominal pain (3.9–6.8%) [1,2]. Despite limited evidence from literature about gastrointestinal bleed (GIB) management in COVID-19, stable patients are often managed conservatively because endoscopies are high-risk aerosol-generating procedures. Herein, we systematically reviewed published literature about the point prevalence of causes of GIB in COVID-19 patients and their outcomes.

A systematic search of *PubMed*, *Google Scholar*, *Embase* and *Scopus databases* was undertaken to extract articles relevant to GIB in COVID-19 on 13 September 2020. The search strategy was implemented using various combinations of the following search terms: "gastrointestinal bleed," "melena," "hematochezia," "upper GI bleed," "lower GI bleed," "rectal bleeding," "hematemesis," "coffee-ground emesis," "black tarry stools," maroon-colored stools," "COVID-19", "SARS-COV-2", "coronavirus." Data about management and clinical outcomes such as rebleeding, mortality and length of hospital stay (LoS) was collected from available case reports, case series and observational studies and summarized using descriptive statistics.

From the initial 400 articles retrieved, 21 studies were finally included after eliminating nonrelevant articles, reviews and duplicates. There were 13 case reports, 5 case series, 2 retrospective observational studies and 1 case–control study. The total sample size consisted of 123 patients with a positive SARS-CoV-2 reverse transcriptase-PCR. The mean age was 63.1 ± 16.4 years, with the majority being males (88/123, 71.5%). Endoscopic evaluation was performed only in 40% cases (49/123), esophagogastroduodenoscopy (EGD) in 40, colonoscopy in 5 and sigmoidoscopy in 4 patients (Table 1). The most common finding on EGD was gastroduodenal ulcers (42.5%, 17/40 patients), followed by esophagitis and esophageal ulcers in 15% (6/40) of individuals. Less common findings included esophageal varices and erosive/hemorrhagic gastritis in 10% (4/40) of patients. Most patients (108/123, 87.8%) were managed conservatively with proton pump inhibitors, somatostatin analogs, vasopressin analogs, intravenous fluid resuscitation and local hemostatic agents. Endoscopic interventions were performed in 12.2% of cases (15/123). Only half (62/123) patients received packed red blood cell transfusion, with a mean number of four transfusions. The GIB-related mortality rate was 1.6% (2/123). Rebleeding occurred in 12 patients (10%). The median LoS was 8 days (interquartile range: 7–28 days).

Our study results show that less than half of the COVID-19 patients (40%) presenting with GIB underwent endoscopic evaluation. Low rates of endoscopy could be attributed to the fear of potential endoscopic transmission of SARS-CoV-2, a need for conserving personal protective equipment, or multiple GI societies' recommendations to defer nonurgent endoscopy [3,4]. Peptic ulcer disease remains the most common finding, and mortality related to GIB in COVID-19 is low (2%), even with low rates of endoscopies during the pandemic. SARS-CoV-2 has also reported to cause acute hemorrhagic colitis; however, the exact role of the virus in causing GIB is still needed to be defined [5]. Furthermore, any case of GIB needs individualized attention, and clinical judgment should prevail, and the focus should be the patient outcome.

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Conception and design: H.G. Statistical analysis: H.G. and S.S. First draft: S.S. All authors critically revised, edited and finally approved the manuscript.

Conflicts of interest

B.T. serves as a consultant for Medtronic and Boston Scientific. For the remaining authors, there are no conflicts of interest.

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Table 1. Clinical presentation of gastrointestinal bleeding, management and outcomes of included cases

Author	Country	Type of study	Clinical presentation	Risk factors	Management	PRBC transfusion	Outcomes
Lotti *et al*. [6]	Italy	Case report	62 years, male Hematochezia	–	Endoscopy to localize the source	NA	Resolution
Carvalho *et al*. [5]	USA	Case report	71 years, female Bloody diarrhea	Lisinopril leading to increased risk of severe COVID?	Sigmoidoscopy to localize the source	NA	Resolution
Cho *et al*. [7]	USA	Case series	Median age 68 years, 2 male Hematochezia	h/o anticoagulation use and aspirin (low dose) in one patient.	PPI, antifungals and antibiotics and colonoscopy to localize the source	NA	Spontaneous resolution
Guotao *et al*. [8]	China	Case report	83 years, male Hematochezia	–	Colonoscopy to reveal the source of bleeding, oral PPI tablet	NA	Resolution
Li *et al*. [9]	USA	Case report	39 years, male Hematemesis, melena, and hematochezia	Thrombocytopenia	Conservative with IV PPI and IVIG for thrombocytopenia	NA	Resolution
Gulen *et al*. [10]	Turkey	Case report	53 years, male Melena	h/o aspirin use, CRF	PPI infusion	3 units PRBC transfusion	Resolution
Li *et al*. [11]	China	Case report	77 years, male Coffee ground emesis	–	Mucosal protective and hemostatic agents, IV PPI, octreotide, gastroscopy to identify the source of bleeding	NA	Resolution within 48 h
Xiao *et al*. [12]	China	Case report	78 years, male Coffee ground gastric contents in the nasogastric tube and fecal occult blood test positive	–	To identify the source of bleeding, Octreotide, PPI	NA	Resolution
Buckholz *et al*. [13]	USA	Case report	35 years, male Melena	Sickle cell trait, post-renal transplantation	Conservative	3 units PRBC transfusion	Resolution in 4 weeks
Malik *et al*. [14]	USA	Case report	32 years, male Hematemesis	Varices	Protonix IV, Endoscopic band ligation	6 units PRBC transfusion and iron sucrose	Resolution
Chen *et al*. [15]	China	Case report	84 years, male Hematochezia		Conservative; octreotide, hemocoagulase and esomeprazole	6 units PRBC transfusion	Died due to unresolved GI bleed
Kassas *et al*. [16]	Egypt	Case report	59 years, male Hematemesis	HCV-related chronic liver disease	Endoscopy to diagnose varices and subsequent band ligation	NA	resolved
Barrett *et al*. [17]	USA	Case series	Median age-75 years, all- male. Melena in 4, hematochezia in 2	Prior anticoagulation in 2 patients, h/o internal hemorrhoids and diverticulosis in one	Conservative management in all, diagnostic endoscopy in one	2 units PRBC transfusions in one patient	GI bleed resolved in all the patients.
Gadiparthi *et al*. [18]	USA	Case series	Median age 57 years, 1 male and 2 females; Melena in 2, rectal bleed in one	h/o RYGB in one, use of fecal management system in the other	Conservative with IV PPI	2 units PRBC transfusions each in all 3 patients	GI bleed resolved in 2; 1 patient had recurrent severe bleeding requiring ICU admission
Cavaliere *et al*. [19]	USA	Case series	Median age 69 years; 3 males and 3 females; 4 melena, 2 hematemesis	–	Conservative with IV PPI	2 units PRBC transfusions in four patients	Spontaneous resolution in all
Mellazini *et al*. [20]	Italy	Case series	Median age 77 years,all Males. Upper GI bleeding; melena and hypotension	h/o anticoagulation use in all	All except one underwent GI endoscopy to identify the source of bleeding; therapeutic endoscopic intervention (adrenaline and clips) in one patient	NA	Resolved in all except one with rebleeding who was treated arterial embolization
Aurelio *et al*. [21]	Italy	Retrospective observational study	Median age 75 years; 18 male and 15 female; Upper GI bleeding; black tarry stools in 12, hematemesis in 5, coffee ground vomitus in 3, severe progressive anemia and dark stools in 3 patients	7 patients on antiplatelet therapy, 18 patients on anticoagulants	Diagnostic EGD in 18 patients, therapeutic in 7, IV PPI therapy given to all except one who was given vasoactive agent because of suspected varices	History of blood transfusion in four patients	Resolved in all, except 3 patients who rebled

(*Continued*)

Table 1. *(Continued)*

Author	Country	Type of study	Clinical presentation	Risk factors	Management	PRBC transfusion	Outcomes
Martin *et al.* [22]	USA	Case–Control Study	Median age 69 years. 27 male and 14 female. Hematemesis in 2, melena in 20, maroon-colored stool in 4, hematochezia in 11, bloody nasogastric tube output, and melena + hematochezia in one each	Past h/o anticoagulation use in 29 patients, antiplatelet use in 20	Diagnostic endoscopy: EGD-10, colonoscopy-1, sigmoidoscopy-4; Therapeutic endoscopic treatment-4	PRBC transfusion given to 30 patients, mean PRBC 3 units	In hospital GIB mortality-1, recurrent bleeding in 5
Shalimar *et al.* [23]	India	Retrospective observational study	Median age 46 years, 17 male and 7 female; Hematemesis in 12, melena in 4, and combined hematemesis and melena in 7 patients, whereas only one patient had fresh bleeding per rectum (hemorrhoidal bleeding).	History of variceal bleed was present in 14/23 (60.9%), history of hepatic encephalopathy was present in 3 (13.0%), the low platelet count in 5, INR (>2) in 3, and creatinine (>1 mg/dl) in 9. Only one patient had Child C and creatinine (>1 mg/dl).	Conservative in all patients (23)	PRBC transfusions in 14 patients	Bleeding resolved in all
Lin *et al.* [24]	China	Case report	77 years, male hematemesis		Diagnostic endoscopy to localize the source of bleeding in the esophagus		
Papanikolao *et al.* [25]	Greece	Case report	40 years, male Hematemesis	Alcoholic chronic liver disease	Diagnostic endoscopy to identify esophageal varices followed by band ligation	NA	Died due to worsening hepatic dysfunction

Dashes indicate not reported.
CRF, chronic renal failure, EGD, esophagogastroduodenoscopy, GI, gastrointestinal; GIB, gastrointestinal bleed; HCV, hepatitis C virus; NA, not applicable; PPI, proton pump inhibitors; PRBC, packed red blood cell; RYGB, Roux-en-Y gastric bypass.

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Baveno-VI clinical staging of cirrhosis underestimates 5-year survival after variceal bleed in cryptogenic chronic liver disease patients in India

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To Editor,

Dear Sir,

The clinical staging in cirrhosis, proposed in the Baveno-VI consensus meeting on portal hypertension, has been globally adopted [1,2].