

## Impact of COVID-19 pandemic on hospital admission for endoscopy unit; single center study

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### Abstract

**Background:** COVID-19 pandemic has resulted in exceptional human, public, and economic impacts worldwide. We aimed to evaluate the impact of COVID-19 on hospital admission for endoscopy unit during the COVID-19 pandemic, 2020 in comparison to similar periods in non COVID-19, 2019. **Methods:** Data from endoscopy unit (between 1<sup>st</sup> April to the end of June 2020) were collected and compared to a similar pre-COVID-19 period in 2019 as regards, hospitalization rate and endoscopy indication. **Result:** Compared with non COVID-19 period in 2019, there was a significant reduction during the similar period of COVID-19 pandemic in 2020 as regards; total number of patients who were admitted to endoscopy unit ( $p < 0.0001$ ), admission for diagnostic endoscopy due to persistent abdominal pain (14.76% versus 17.81%,  $p < 0.0001$ ) and follow up band ligation of esophageal varices (48.70% Vs 50.52,  $p < 0.0001$ ). No significant change between both studied times as regards hospital admission due to gastrointestinal bleeding (25.38% Vs 23.89,  $p = 0.51$ ) and foreign body swallows. Admitted patients had a similar gender distribution in both studied periods ( $p = 0.61$ ). In comparison to non COVID-19 times, the majority of admitted patients during pandemic time of COVID 19 were younger than 60 years (65.68% Vs 39.20%,  $p < 0.0001$ ). **Conclusion:** Our result demonstrated a significantly lower admission rate for endoscopy during pandemic time of COVID-19 in comparison to similar non pandemic time in 2019, however, hospitalization for urgent endoscopy dose not affected by pandemic time especially for upper gastrointestinal bleeding, suspected malignancy and foreign body swallows.

**Keywords:** COVID-19, Endoscopy, Gastrointestinal bleeding, Hospital admission.

### Introduction

WHO on March 11<sup>th</sup>, 2020, declared SARS-CoV-2 as a global public health crisis. The typical clinical symptoms of COVID-19 included, cough, sore throat, fever, fatigue, and shortness of breath<sup>1</sup>. Human-to-human transmission occurs through respiratory secretions, aerosols, and contaminated environmental surfaces<sup>2,3</sup>. Transmission can occur in both symptomatic and asymptomatic individuals<sup>4</sup>. Gastrointestinal symptoms are not uncommon and 5% of patients had nausea or vomiting and 3.8-10.1% had diarrhoea<sup>5</sup>. The overall mortality was 1.4%, and for those with severe disease the mortality was 22.4%<sup>6,7</sup>. Performing gastrointestinal endoscopy through the existing COVID-19 pandemic is challenging. Recommended endoscopy is limited for urgent conditions such as acute gastrointestinal bleeding, gastrointestinal obstruction requiring stenting or foreign body retrieval, however some non-urgent procedures are of higher importance for resumption and may need to be performed such as cancer evaluations and evaluation of significant symptoms<sup>8</sup>. There has been a concurrent decline in patients presenting with many acute medical conditions, including acute coronary syndromes (ACS)<sup>9,10</sup>. To date, it is unknown whether similar trends are apparent in hospital admission for endoscopy unit. Therefore, the aim of the present study is to evaluate the impact of COVID-19 on hospital admission for endoscopy unit from the start of April to end of June 2020 and compare it with the same period in 2019.

### Methods

This is a retrospective study of clinical and endoscopy characteristics of consecutive patients who



were admitted to endoscopy unit, Gastroenterology and Hepatology, Department (Damietta Cardiology and Gastroenterology center). The study period was defined as the time from the start of April to the end of June 31, 2020. The numbers of consecutive patients hospitalized for endoscopy unit during COVID-19 pandemic study time in 2020 and a similar period during the previous non COVID-19 year 2019 were compared. Subsequently, a detailed comparison of patients hospitalized during the COVID-19 pandemic and patients presenting in the same period in years (2019) as regard the indication of endoscopy were performed. All patients were admitted to the hospital via the emergency department. To avoid statistically bias, patients with bleeding per rectum who needed a colonoscopy were excluded as, this period from the year included the Ramadan month (The month of Muslim fasting) and most of patient prefers to postpone the colonoscopy to pass the this month. Also, patients <18 years of age were excluded from the study as our center is not qualified to perform the endoscopy management at this age. The primary outcome was the overall rate of hospital admissions for upper gastrointestinal bleeding and their clinical characteristics. Prior to a programmed endoscopic procedure, all patients were called and surveyed about respiratory symptoms and signs, exposure to SARS-CoV-2 (contact and travel history), measure their temperature and categorized according to COVID-19 risk<sup>11</sup>. Also, all staff has daily measurements of temperature before starting work. Interactions with patients (such as informed consent, vital signs) have to be performed while maintaining some distance, and with rigorous hand washing routines before and after interactions. Personal protective equipment (PPE) is to be worn for all procedures, and the components vary according to patient risk stratification. For all low-risk patients and for intermediate-risk patients undergoing upper GI procedures, PPE includes surgical mask, hairnet, goggles, single-use gown, and gloves. For high-risk patients and for intermediate-risk patients undergoing upper gastrointestinal endoscopy procedures, PPE should include a respirator mask (such as N95), hairnet, goggles and/or face shield, long-sleeved water-resistant gowns, and at least two pairs of gloves according to CDC mitigation strategies<sup>12</sup>. Incidence rates for the primary outcome were calculated by dividing the number of cumulative admissions per month for each time period.

### Statistical analyses

Baseline characteristics of the study populations were compared using the Pearson Chi-square test for categorical variables. Categorical variables were reported as numbers (percentage).

### Results

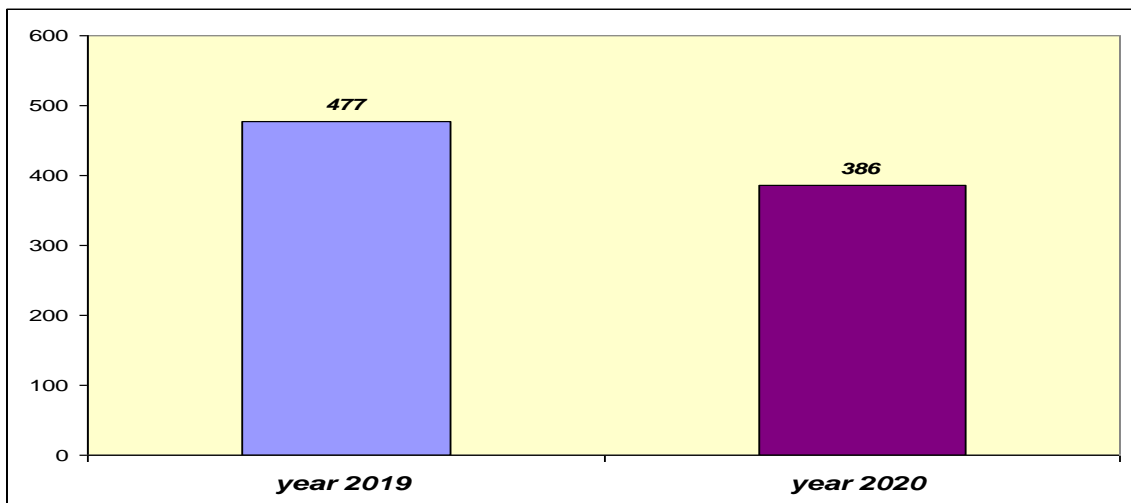
During the study periods; 386 patients were hospitalized in endoscopy unit during pandemic time of COVID-19 (between 1<sup>st</sup> April to the end of June 2020), which was significantly lower than the number of patients (477 patients) who were admitted during the same period before COVID-19 pandemic in the year 2019, ( $p < 0.0001$ ), **tab. (1) & fig. (1)**. There was a non significant change regarding gender distribution in pandemic time and pre-pandemic time, men (65.28% vs. 62.98%) and similar proportions of women (34.71% versus 37.10%). As regards the age of admitted patients during the study periods, in pandemic time of COVID-19 (2020), the majority of admitted patients were younger than 60 years (65.68%) in comparison to (39.20%) patients during 2019 with significant shifting of admitted patients during pandemic time towards younger age ( $p < 0.0001$ ), **(1) & fig. (2)**. A significant reduction of admitted patients older than 60 years was found during the pandemic period (2020) in comparison to similar time during 2019 (33.41% Vs 60.79%,  $p < 0.0001$ ). We observed that, there was a significant reduction of total number of admitted patients for diagnostic endoscopy (due to persistent abdominal pain and hematemesis and/or melena) in pandemic time, 2020 versus the similar period during 2019, (40.15% versus 41.71% ( $p < 0.001$ )). Moreover, there was a significant reduction in patients admitted for diagnostic endoscopy due to persistent abdominal pain during pandemic time versus similar period 2019 (14.76% versus 17.81%,  $< 0.001$ ), however, no significant change between both studied time as regards patients admitted to endoscopy unit due to upper gastrointestinal bleeding (hematemesis and/or melena) (25.38% Vs 23.89,  $p = 0.51$ ). We observed that, patients hospitalized in 2020 to follow up band ligation of esophageal varices were significantly lower compared to 2019 (48.70% versus 50.52%,  $p < 0.0001$ ). There was non significant difference between both times of the study as regards patients admitted to endoscopy unit due to foreign body swallows ( $p = 0.296$ ), however a



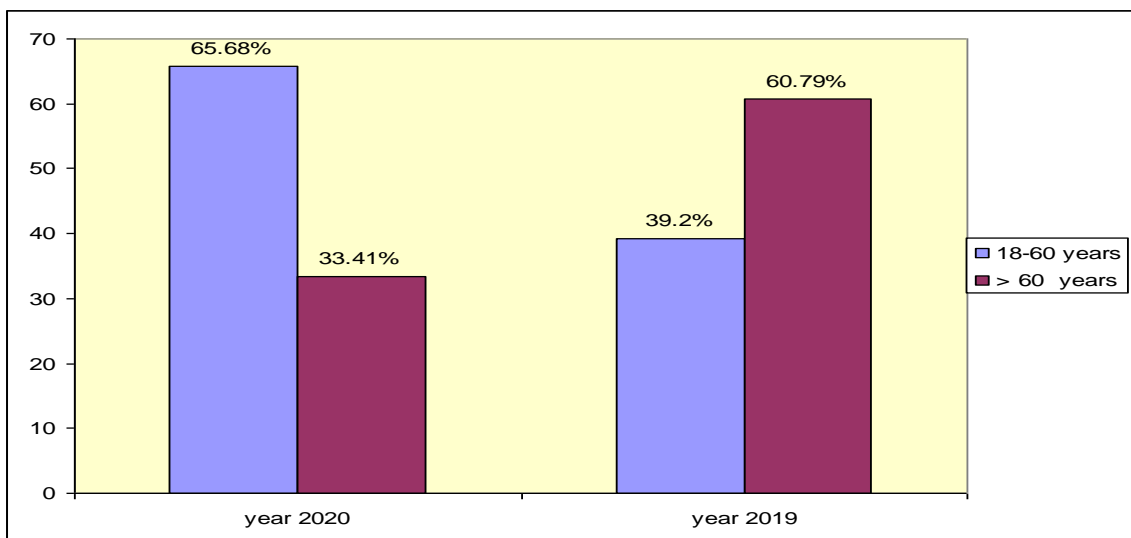
significant increase in patients admitted during the pandemic period due to the suspected malignancy and biopsy taken in comparison to the same time in 2019 (9.06% Vs 6.49%, .019).

**Table 1.** Characteristics of studied patients admitted to endoscopy unit.

	Monthly average of 2020			Total N,%	Monthly average of 2019			Total N/%	P value
	April	May	June		April	May	June		
<b>Number of admitted patients</b>	123	95	168	386	212	179	86	477	<.0001
<b>Gender</b>									
<b>Male</b>	83	73	96	252,65.28%	156	88	56	300,62.98	0.46
<b>Female</b>	40	22	72	134,34.71%	66	81	30	177,37.10	
<b>Age</b>									
<b>18-60 years. N, %</b>	84	64	109	257,65.68	87	71	29	187,39.20	<0.001
<b>&gt;60 years. N, %</b>	39	31	59	129,33.41	125	108	57	290,60.79	<0.001
<b>Diagnostic (Total). N, %</b>	51	38	66	155,40.15	82	79	38	199,41.71	<0.001
<b>Persistent epigastric pain</b>	15	8	34	57,14.76	42	36	7	85,17.81	<0.001
<b>Hematemesis and/or melena</b>	36	30	32	98,25.38	40	43	31	114,23.89	0.51
<b>Follow up band ligation of esophageal varices</b>	55	52	81	188,48.70	115	86	40	241,50.52	<.0001
<b>Foreign body swallowed</b>	4	1	3	8,2.07	2	3	1	6,1.25	0.296
<b>Biopsy for suspected malignancy</b>	13	4	18	35,9.06	13	11	7	31,6.49	0.019



**Figure 1.** Total admission to endoscopy unit during COVID-19 pandemic time and in corresponding time periods in 2019.



**Figure 2.** Age of admitted patients during the study periods.



## Discussion

No data is known about the impact of COVID 19 on the hospital admission to endoscopy unit. We report a significant decline in hospitalization rate in the endoscopy unit during the COVID-19 pandemic compared to before the pandemic in the preceding year (2019). Previous studies declared a significant decline in hospitalization during the COVID-19 for patients with many acute medical conditions such as heart failure and acute coronary syndrome, additionally; these studies demonstrated that, the hospitalized patients had more severe symptoms at admission<sup>9,10,13</sup>. Our data might suggest that elderly patients have avoided presenting to hospital during the pandemic period of COVID 19, as the majority of admitted patients were younger than 60 years (65.68%, age range 18-60 years) in comparison to (39.20%) of patients with similar age range during the non pandemic period in 2019. The possible explanation of this decline in old aged patients admission versus young age during pandemic could be due to fear of old age patients from infection by COVID 19 especially that, the old age carries many risk factors of COVID-19 infection. Furthermore, these patients usually have a greater burden of co-morbidities, including chronic obstructive pulmonary disease, diabetes mellitus increasing the possibility of infection<sup>14,15</sup>. Importantly, in this study although there is decline in hospitalization for endoscopy in pandemic period versus same period during non pandemic time regarding diagnostic endoscopy specially for persistent abdominal pain, the rate of patients hospitalized for diagnostic endoscopy due to upper gastrointestinal bleeding dose not showing significant change between both studied time indicating the importance of this emergency that is life threatening condition needs urgent management 16 and not affected by any pandemic. This result is in accordance with previous studies demonstrated that, the hospitalized patients during pandemic time had more severe symptoms at admission<sup>9,10,13</sup>. Also, during the pandemic period, there is a significant reduction in patients admitted to follow up band ligation of esophageal varices in comparison with similar patients admitted in the same period during 2019 (48.70% Vs 50.52%). There was non significant difference between both times of the study as regard patients admitted to endoscopy unit due to foreign body swallows, however a significant increase in patients admitted during the pandemic period due to the suspected malignancy and biopsy taken in comparison to the same time in 2019 (9.06% Vs 6.49%, .019). The limitation of this study is that, it is a single center study.

## Conclusion

*Taken together, our result suggests that, although there is a clear reduction of patients hospitalized*

*in the endoscopy unit during pandemic time of COVID-19, the urgent endoscopy dose not affected by pandemic time especially for upper gastrointestinal bleeding, suspected malignancy and foreign body swallows.*

## References

1. Guan W, ZY N, Hu Y, et al. China medical treatment expert group for COVID-19. clinical characteristics of coronavirus disease 2019 in China. **N Engl J Med.** 2020; 382: 1708-1720.
2. Rio C del, Malani P. COVID-19—New insights on a rapidly changing epidemic. **JAMA.** 2020; 323 (14): 1339-1340.
3. Xiao F, Tang M, Zheng X, , et al. Evidence for gastrointestinal infection of SARS-CoV-2. **Gastroenterology.** 2020; 158 (6): 1831-1833.
4. Bai Y, Yao L, Wei T, et al. Presumed asymptomatic carrier transmission of COVID-19. **JAMA.** 2020; 323 (14): 1406-1407.
5. Wang D, Hu B, Hu C, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. **JAMA.** 2020; 323 (11): 1061-1069.
6. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. **Lancet.** 2020; 395: 497-506.
7. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. **Lancet.** 2020; 395: 507-513.
8. Chiu PWY, Ng S, Inoue H, et al. Practice of endoscopy during COVID-19 pandemic: Position statements of the Asian Pacific Society for Digestive Endoscopy (APSDE-COVID statements). **Gut.** 2020; 69: 991-996.
9. De Filippo O, D'Ascenzo F, Angelini F, et al. Reduced rate of hospital admissions for ACS during Covid-19 outbreak in northern Italy. **N Engl J Med.** 2020; 383 (1): 88-89.
10. Metzler B, Siostrzonek P, Binder R, et al. Decline of acute coronary syndrome admissions in Austria since the outbreak of COVID-19: The pandemic response causes cardiac collateral damage. **Eur Heart J.** 2020; 41: 1852-1853.
11. Implementation of Mitigation Strategies for Communities with Local COVID-19 Transmission. March 2020. <https://www.cdc.gov/coronavirus/2019-ncov/downloads/community-mitigation-strategy.pdf>. (March 18, 2020).
12. Repici A, Maselli R, Colombo M, et al. Coronavirus (COVID-19) outbreak: What the department of endoscopy should know. **Gastrointest Endosc.** 2020; 92 (1): 192-197.



13. Bromage D, Cannatà A, Rind I, et al. The impact of COVID-19 on heart failure hospitalization and management: Report from a heart failure unit in London during the peak of the pandemic. **Eur J Heart Fail.** 2020; 22 (6): 978-984.
14. Wang L, He W, Yu X, et al. Coronavirus disease 2019 in elderly patients: Characteristics and prognostic factors based on 4-week follow-up. **J Infect.** 2020; 80 (6): 639-645.
15. Remuzzi A, Remuzzi G. COVID-19 and Italy: What next?. **Lancet.** 2020; 395: 1225-1228.
16. Garcia-Tsao G, Abraldes J, Berzigotti A, et al. Portal hypertensive bleeding in cirrhosis: Risk stratification, diagnosis, and management: 2016 Practice guidance by the American Association for the Study of Liver Diseases. **Hepatol.** 2017; 65 (1): 310-335.