Original Article

Gastrointestinal symptoms among patients with COVID-19 and their relation with co-morbidities

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ABSTRACT

Background: *Initially, coronavirus disease 2019 (COVID-19) was considered as respiratory disease; later on, it was seen that a large number of patients develop gastro-intestinal (GI) symptoms. Many patients with COVID-19 have underlying co-morbidities. This study was conducted to evaluate the frequency of GI symptoms in COVID-19 patients and to find out its relation with co-morbidities.*

Methods: *This cross-sectional study was done among consecutive COVID-19 positive patients admitted in Mugda Medical College Hospital, Dhaka, Bangladesh from July to September 2020. Information regarding patients' symptoms and co-morbidities were collected in predesigned structured questionnaire.*

Results: *Among 166 COVID-19 patients, 69% had GI symptoms. Common GI symptoms were anorexia (69%), ageusia (38%), diarrhea (35%) and nausea (31%). Sixty percent patients with GI symptoms had co-morbidities; common comorbidities were hypertension (55%) and diabetes mellitus (47%). Comorbidities were more common among patients with GI symptoms (69%) than those without GI symptoms (31%) (p 0.001).*

Conclusion: *This study reflects that over two-thirds of COVID-19 patients developed GI symptoms. More than half of the patients with GI symptoms had co-morbidities. Co-morbidities were common among patients with GI symptoms than non-GI symptoms.*

Key words: *COVID-19, gastro-intestinal symptoms, diabetes mellitus, hypertension, co-morbidity.*

INTRODUCTION

Respiratory system is the primary organ system which sustained severe manifestation in coronavirus disease 2019 (COVID-19) and complications of this infection as pneumonia, pulmonary embolism and acute respiratory distress syndrome (ARDS). Coronavirus infection of gastro-intestinal tract (GIT) in both human and animals are well known.[1,2] In a study among 140 patients, 24% presented with one or more gastrointestinal (GI) symptoms; among them abdominal pain was recorded in 42 patients (30%), diarrhea in 41 patients (29%), loss of appetite in 40 patients (29%) and vomiting in 32 patients (22%).[3] Another study showed nausea and or vomiting was present in 56% and diarrhea in 38%.[4] Another study showed patients without digestive symptoms were more likely to be cured and discharged than patients with digestive symptoms (60% vs. 34.3%).[5]

The GI manifestations secondary to severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) infections can occur through different mechanisms. Firstly, angiotensin converting enzyme 2 (ACE2) receptors, by which the virus gains cellular entry, is expressed in both the respiratory and GIT epithelium, creating the potential for viral replication in the GIT. Secondly, there could be a direct injury of the GI system due to an inflammatory response.[5] Absorptive enterocytes may be infected and destroyed by SARS-CoV-2, potentially leading to malabsorption, unbalanced intestinal secretion and an activated enteric nervous system resulting in symptoms like diarrhea.[6] In general, presence of co-morbidities is associated with poorer outcomes in patients with COVID-19. This may have implications for the management of patients with pre-existing digestive diseases.[7] In one study, the prevalence of diabetes was 7.7%, hypertension was 15.6%, cardiovascular disease was 4.7% and malignancy was 1.2%.[8]

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Studies on clinical features of COVID-19 in different centers revealed that GIT manifestation of COVID-19 and their relation with co-morbidities need proper exploration for overall management. At present, there is scarcity of research in our country on this issue. So, our objectives of this study were to find the GI manifestation of COVID-19 and their relation with co-morbidity in confirmed COVID-19 cases.

METHODS

This cross-sectional study was conducted in Mugda Medical College Hospital, Dhaka, Bangladesh from July to September 2020 among consecutive COVID-19 positive patients. Ethical clearance was taken from Ethical Board of Mugda Medical College. Patients were properly instructed about the study procedure and written informed consent was taken maintaining confidentiality. Demographic profiles, co-morbidities and symptoms of the patients were collected by face to face interview in a predesigned structured questionnaire either from patient or from attendant. Patients with severe psychiatric disorders, altered level of consciousness, patients on ventilator, patients not able to talk due to severe respiratory distress and those who did not have attendants were excluded from this study. Data were collected, tabulated and s analyzed by using window based computer software device with statistical package for social science version 22 (SPSS Inc. Chicago IL). Patient characteristics were reported as means ± standard deviations or number (percent) as appropriate.

RESULTS

Total patients were 166 and among them 114 (69%) had GI symptoms and 52 (31%) did not have any GI symptom (non-GI symptoms). Mean age of the patients was 49.09 ± 14.10 years in GI symptom group and 44.53 ± 15.82 years in non-GI symptom group (Table I).

Table I. Comparison of demographic profile between COVID-19 patients having GI symptom and not having GI symptom

		Patients with GI symptom n (%)	Patients without GI symptom n (%)	P value
Age (Years)	<20	0(0.00)	1(1.92)	0.050
	21-30	7(6.14)	16(30.76)	
	31-40	14(12.28)	21(40.38)	
	41-50	18(18.42)	5(9.61)	
	51-60	39(34.21)	8(15.38)	
	61-70	23(20.17)	0(0.00)	
	71-80	10(8.77)	0(0.00)	
	>80	0(0.00)	1(1.92)	
	Mean	49.09 ± 14.10	44.53 ± 15.82	
	Total	114	52	
Sex	Male	60(52.63%)	21(40.38%)	0.019
	Female	54(47.37)	31(59.62)	
Marital status	Married	111(97.37%)	49(94.23%)	0.007
	Unmarried	3(2.63%)	3(5.77%)	
Profession	Business	14(12.28%)	9(17.3%)	0.027
	Service holder	54(47.37%)	26(50.0%)	
	House wife	28(24.56%)	7(13.46%)	
	Labourer	5(4.39%)	0(0.0%)	
	Others	13(11.40%)	10(19.24%)	
Place of living	Urban	104(88.89%)	48(92.3%)	0.059
	Rural	10(11.11%)	4(7.7%)	
Religion	Islam	105(92.11%)	47(90.39%)	0.002
	Hindu	9(7.89%)	5(9.61%)	
Smoking	Non-smoker	103(90.35%)	44(84.62%)	0.018
	Smoker	6(5.26%)	3(5.7%)	
	Ex-smoker	5(4.39%)	5(9.62%)	

Male were more in GI symptom group (53% versus 47%) whereas female were more predominant in non-GI symptom group (60% versus 40%). Anorexia (69%) was the most common GI symptom followed by ageusia, diarrhea, nausea, vomiting and abdominal pain (46%, 38%, 35%, 31%, 16% and 14% respectively) (Figure 1). Among GI symptom group, 60% patient had co-morbidities whereas in non-GI symptom group 58% had co-morbidities. Most common co-morbidities were hypertension (55%) followed by diabetes (47%) (Table II). Regarding co-morbidities no statistically significant difference was found between GI and non-GI symptom group (p=0.089). But GI symptoms were significantly common among patient without co-morbidities than non-GI symptoms (p=0.001) (Table III).

Table II. Co-morbidities of COVID-19 patients

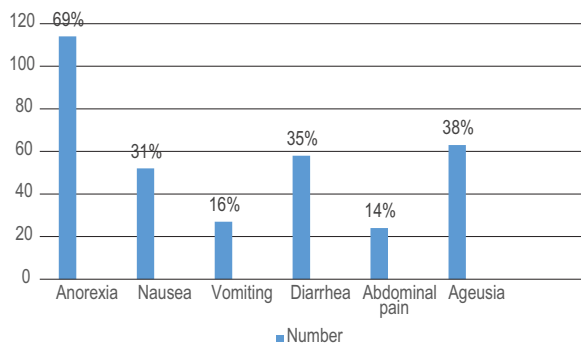| Type of co-morbidities	Number	Percentage
Diabetes mellitus	48	47.06
Hypertension	56	54.90
Liver cirrhosis	6	5.88
Neurological disease	1	0.98
Chronic kidney disease	6	5.88
Chronic obstructive pulmonary disease	5	4.90
Asthma	14	13.72
Heart disease	19	18.63
Malignancy	1	0.98
Obesity	0	0.0
Pregnancy	2	1.96
On immunosuppressive drugs	0	0
Other chronic Illness	3	2.94

Figure 1. Distribution of study population according to GI symptom

Table III. Comparisons of co-morbidities between GI symptoms and Non-GI symptoms

	GI symptoms	Non-GI symptoms	p-value
Co-morbidities	68(41.0%)	30(18.1%)	0.089
Without Co-morbidities	44(26.5%)	24(14.5%)	0.001

DISCUSSION

This study was done to see the frequency of GI manifestations among COVID-19 positive patients and its correlation with co-morbidities. Among 166 COVID-19 positive patients, 69% developed GI symptoms. Han et al from Wuhan showed 23% COVID-19 patients had developed GI symptoms.[9] In another cross-sectional study enrolling 204 patients, 48.5% patients presented with GI symptoms.[10]

Mean age of the patients was 49.09 ± 14.10 years in patients with GI symptoms. In patients with GI symptoms, 53% were male and 47% were female. In an Italian study, mean age of the GI symptoms patients was 68.2 ± 14.2 years with 64% male and 35% female.[11] In this study most common GI symptom was anorexia (69%) followed by ageusia (38%), diarrhea (35%), nausea (31%), vomiting (16%) and abdominal pain (14%). A study done in Bangladesh showed that the common GI symptoms were anorexia (44.7%), diarrhea (35%) and nausea.[12] Another study revealed that among GI symptoms, most common are nausea (4.3%), vomiting (3.8%), diarrhea (3.6%) and abdominal pain (1.2%).[11]

Three-fifths of patients with GI symptoms in recent study had co-morbidities and most common co-morbidity was hypertension followed by diabetes. Comorbidities were more (69%) among patients with GI symptoms. A meta-analysis showed that most common co-morbidities were hypertension, cardiovascular and cerebrovascular conditions and diabetes.[13] In a recent study done in Bangladesh showed that co-morbidities (74.7%) were more common in patients with GI symptoms.[12] Our study also revealed that GI symptoms were also significantly common in patients without co-morbidities than non-GI symptoms patients.

Small numbers of patients were studied in this study and we did not include patients with severe and critical COVID-19 cases. In conclusion, this study reflects that

over two-thirds of COVID-19 patients had GI symptoms; common GI symptoms were anorexia, ageusia, diarrhea. Patients with GI symptoms had significantly more co-morbidities than those without GI symptoms.

Authors' contribution: MA did literature review, data collection and analysis and article writing. RB did literature review and data processing. MABS collected data. TM did literature review and data collection. ABMNA did literature review and data analysis. MMH did literature review and article writing. All authors read and approved the final manuscript for submission.

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