Research Article

A CROSS SECTIONAL ANALYSIS OF THE GASTROINTESTINAL SYMPTOMS IN COVID- 19 INFECTED PATIENTS AND COMPARISON OF TREATMENT OUTCOME IN PATIENTS PRESENTING ONLY WITH GASTROINTESTINAL SYMPTOMS, PATIENTS PRESENTING GASTROINTESTINAL & RESPIRATORY SYMPTOMS AND PATIENTS PRESENTING WITH RESPIRATORY SYMPTOMS-A RETROSPECTIVE STUDY

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ABSTRACT

Background and objectives: The corona virus -2 (SARS-coV-2) is the cause for the global pandemic and COVID 19 infection presents with a myriad of symptoms that is not limited to only the respiratory system. The prevalence of gastrointestinal symptoms requires significant attention owing to its common occurrence among patients with COVID-19 infections. The most common GI symptoms reported in COVID 19 infection are diarrhoea, nausea, vomiting, and abdominal discomfort and found present in almost 25– 27% of patients in some populations. The aim of the present study is to detect the pronounced prevalence of clinical GI symptom in patients with Covid 19 infection, as well as the comparison of impact of treatment outcomes in patients presenting with only GI symptoms and patient presenting with respiratory symptoms. Methodology: Data was obtained from electronic medical records of 752 COVID-19 confirmed patients hospitalized at a jumbo covid facility of Mumbai metropolitan region. The presenting signs and symptoms of the study participants were extracted from the electronic medical records for further analysis. Informed consent was obtained from the participants and the institution ethics committee clearance was obtained prior to the commencement of the study. The obtained data was statistically analysed at confidence interval of 95% (p<0.05). Results and Discussion: 752 patients with overall sex ratio of 1.46:1 (M 447, F 305) were evaluated. Of these 246 patients presented with GI symptoms only [1.05:1 (M 126, F 120)]. Mean oxygen saturation in GI only symptom group (97.58 + 1.53%) was significantly higher than respiratory symptom only group (97.16 + 1.96%), duration of hospital stay was 8.54 + 3.55 days in GI group which was significantly higher. Of the total number of participants, 621 patients completely recovered while remaining 131 shifted to ICU. Outcome of treatment was not associated with presenting symptom in Covid 19 infection (p = 0.314). Conclusion: The findings of the present study showed that the overall prevalence of GI symptoms in COVID 19 affected individuals was 66.35% and around one-third of the patients presented only with GI symptoms. The mean oxygen saturation and the mean hospitalization was also significantly different in patients with only GI symptoms. Gastrointestinal symptoms such as anorexia, nausea, vomiting and diarrhoea can be common presenting symptoms in COVID-19 not only in combination with respiratory symptoms but in rare cases as sole presenting symptom.

INTRODUCTION

Severe acute respiratory syndrome Corona Virus-2 (SARS-COV-2) is a novel coronavirus infection mainly affecting the respiratory system, which was considered as the primary cause for the outbreak of COVID-19 over the world.[1]Since its initial isolation in December 2019 from Wuhan, China the infection has spread to majority of the countries and infected millions worldwide. The term "coronavirus" is derived from the Latin word CORONA meaning "crown" as its structure resembles a crown with multiple spikes under an electron microscope.[2] SARS-COV-2 is an enveloped positive sense single-stranded RNA virus with multiple spikes on the surface having a genome size of approximately 26-32 kilobases and belonging to the genera beta coronavirus.[3]

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As per the latest statistics of World Health Organization (WHO), the number of infected people in the world is close to 186 million with over 30 million infected in India.[4] The death count of individuals affected by COVID-19 has crossed 4 million.[4] The mortality rate of SARS-COV-2 is lesser compared to the previous infections of SARS and MERS but a high human to human transmission rate.[5] The incubation period for COVID- 19 infection is typically 1 to 14 days which may extend upto 24 days.[6] Most human cases of COVID-19 are mild with 5% of the infected patients developing severe symptoms that requires mechanical ventilation and intensive care hospitalization. The most common symptoms are fever, dry cough, shortness of breath, dysosmia and dysgeusia.[7] In addition, the gastrointestinal system has been found to be affected in many patients.[8] The clinical symptoms of COVID-19 are broadly classified into three classes. The most common are fever, dry cough and tiredness. Less common symptoms are bodyaches, sore throat, diarrhoea, loss of taste or smell and severe symptoms are difficulty in breathing or shortness of breath, chest pain or pressure and loss of speech or movement.[9] The presence of respiratory symptoms are considered to be of importance in diagnosis and treatment of COVID-19 infection. Nevertheless, it is important to consider symptoms originating from other systems such as gastro-intestinal system and liver since these organs also express angiotensin converting enzyme-2 (ACE2), the major receptor for SARS-CoV-2.[10] Gastro-intestinal symptoms such as anorexia, nausea, vomiting and diarrhoea were reported in patients infected with COVID-19 and SARS-CoV2–induced diarrhoea could be the onset symptom in these patients. It has been reported that Compared with patients without digestive symptoms, those presenting with digestive symptoms have a longer time from onset to admission and a worse prognosis.[11]. On rare occasions, GI symptoms might me the only presenting symptom for COVID-19 patients.

Considering the clinical importance and treatment outcome of gastrointestinal symptoms in patients with COVID-19 infections, the aim of the present study was to evaluatethe occurrence of gastrointestinal symptoms in COVID- 19 infected patients in Indian sub-population and to compare the impact of treatment outcome in patients presenting only with gastrointestinal symptoms and those presenting with respiratory symptoms.

METHODOLOGY

The cross-sectional study was performed in patients who were hospitalized at a jumbo covid facility of Mumbai metropolitan region. A total of 752 confirmed COVID-19 patients were randomly selected for the study and their medical records from the electronic database were obtained. The presenting signs and symptoms of the study participants were extracted from the electronic medical records for further analysis. The study participants were evaluated for the presence of either GI symptoms or respiratory symptoms alone or in combination, mean oxygen saturation levels, mean duration of hospital stay and final outcome. The data obtained were tabulated in excel sheet and statistically analysed at confidence interval of 95% (p<0.05) using Chi-Square test and ANOVA test.

RESULTS

752 people diagnosed as Covid 19 positive by RTPCR test after exposure or presenting with suspicious symptoms were included in study. Overall sex ratio in study was 1.46:1 (M 447, F 305) while it was 1.05:1 (M 126, F 120) in GI group. Females were associated to present with GI only symptoms only (chi-square 11.2433, p = 0.003619). The mean age of 752 study sample was 49.64 $\pm$ 15.10 years with highest 88 and lowest 21 years. There was no significant difference in those with only GI symptom (50.47 $\pm$ 16.76) and only respiratory symptom (50.61 $\pm$ 15.10) or both symptoms (47.86 $\pm$ 14.89). (p = 0.07).

246 patients were presented with GI symptom only (135 Diarrhoea, 111 Vomiting), 253 with respiratory symptom only and remaining 253 with both GI and respiratory symptoms. Hence overall prevalence of GI symptom in Covid 19 was 66.35%. 373 patients were having some sort of co-morbidities like diabetes, hypertension or thyroid disorders.

Mean oxygen saturation in GI only symptom group (97.58 $\pm$ 1.53%) was significantly higher than respiratory symptom only group (97.16 $\pm$ 1.96%) and difference was statistically significant (p = 0.02). (Image 1)

Mean duration of hospital stay was 7.94 $\pm$ 3.45 days with significant difference between groups (p = 0.04). Mean duration of hospital stay in 8.54 $\pm$ 3.55 in GI group which was significantly higher than 7.5889 $\pm$ 2.61 respiratory only group (p = 0.006) and 7.72 $\pm$ 3.97 days in both symptoms group (p = 0.021). (Image 2)

Total 621 patients recovered by treatment while remaining 131 were shifted to ICU for further management. 210 patients with GI only symptoms completely recovered from the illness. There was no association found between presenting symptom and their outcome of treatment. (Chi square 2.3161, p value 0.314).
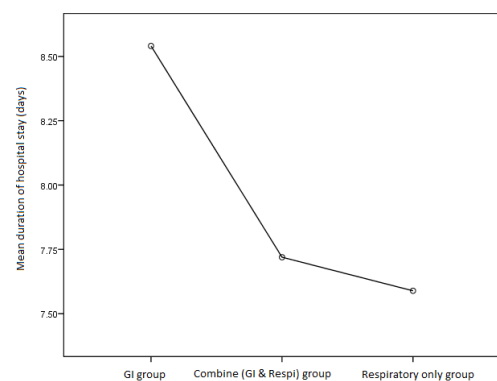
Image 1 Mean duration of hospital stay among study sample
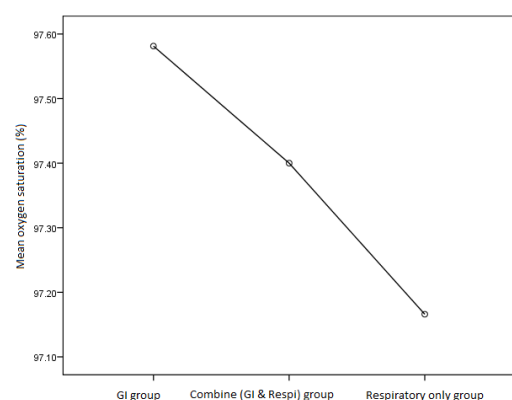
Image 2 Mean oxygen saturation among study sample

DISCUSSION

This cross-sectional study was conducted in 752 participants to evaluate the GI symptoms and compare the treatment outcome of patients with GI symptoms with respiratory symptoms. Of the total patients evaluated, 246 patients were presented with GI symptom only (135 Diarrhoea, 111 Vomiting), 253 with respiratory symptom only and remaining 253 with both GI and respiratory symptoms. The overall prevalence of GI symptoms in COVID 19 affected individuals was 66.35%. Further, the mean oxygen saturation and the mean duration of hospitalization was significantly higher in patients presenting only with gastrointestinal symptoms in comparison with other groups. The findings of the present study clearly indicates the clinical significance of gastrointestinal symptoms in COVID-19 infection.

A study performed in 1099 patients with laboratory-confirmed COVID-19 in China showed that nausea or vomiting and diarrhoea were reported in 55 (5%) and 42 (3.8%) patients, respectively.[12]Pan et al (2020) described the clinical characteristics of COVID-19 patients with digestive symptoms in Hubei, China and found that 204 patients with COVID-19 infections48.5% presented with digestive symptoms as their chief complaint. Patients with digestive symptoms had a variety of manifestations, including anorexia (83.8%), vomiting (0.8%), diarrhoea (29.3%), and abdominal pain (0.4%).[13]In a systematic review and meta-analysis finding, the pooled prevalence of digestive symptoms was 15%, with common symptoms being nausea or vomiting, diarrhoea and anorexia. Also, the authors reported that around 10% of the patients reported only with gastrointestinal symptoms without any respiratory symptoms which may lead to delayed diagnosis and increased spread of infections.[14]

Studies have shown that SARS-CoV -2 infects the GI tract via its viral receptor Angiotensin converting enzyme II which is expressed on enterocytes of the ileum and colon.[15] ViralRNA has also been isolated in stool specimens of COVID-19 patients, raising concern forfaecal- oral transmission in addition to droplet transmission.[16]Research performed by Wang et al (2020) and Xiao et al (2020) showed that 29% and 53% patients with COVID-19 tested positive for the virus in stool in their respective studies.[16,17]Additionally, prolonged presence of the SARS-CoV-2 viral RNA in stool samples have been reported when compared to their presence in respiratory samples.[18]

In majority of the studies reported in the literature, while the focus was primarily on the presence or absence of gastrointestinal symptoms in patients with COVID-19, there are other reports which did not find any statistical difference in terms of co-morbidities, length of stay and mechanical ventilation in COVID-19 patients with GI symptoms than those without GI symptoms.[19,20]On the contrary the present study, in addition to reporting the presence of GI symptoms, the authors have attempted to compare the mean oxygen saturation as well as hospitalization of these patients in comparison to those who have only respiratory symptoms and those with both respiratory and GI symptoms. The significant difference in these two parameters highlights the importance of identifying patients with GI symptoms for appropriate management.

CONCLUSION

Since the emergence of COVID-19 pandemic, the scientific community is constantly striving to understand the clinical manifestations, treatment and the long-term outcome for better patient management. The introduction of vaccines have reduced the incidence as well as morbidity and mortality of COVID-19 infections. Nevertheless, waves of COVID-19 infections are continuously reported throughout the world and the fact that the disease continue to remain in endemic form needs constant attention and improvement in treatment modalities. While it is well understood that COVID-19 is primarily a respiratory infection, symptoms originating from other organs such as gastrointestinal and liver should be known. The findings of the present study showed that the overall prevalence of GI symptoms in COVID 19 affected individuals was 66.35% and around one-third of the patients presented only with GI symptoms. The mean oxygen saturation and the mean hospitalization was also significantly different in patients with only GI symptoms.Based on these findings, the clinician should be aware of the GI symptoms especially diarrhoea as a presenting feature in COVID-19 along with other respiratory symptoms and also in rare cases as the only presenting symptom. Secondly, the reports suggesting the virus remains in GI system for a prolonged period of time may have clinical implications in long COVID. Thirdly, presence of the virus in the stool may lead to its transmission via faecal-oral route thereby emphasizing the importance of frequent and proper hand hygiene especially in areas of poor sanitation.

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