Analysis of Gastrointestinal Symptoms in 281 Cases of Hospitalized Covid 19 Patients, Single-Center Study

Hastanede Yatan Covid 19 Tanılı 281 Vakada Gastrointestinal Semptomların Analizi, Tek Merkez Çalışma

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ABSTRACT

Objective: Although Covid-19 which has been identified as the disease caused by SARS COV-2 virus mainly affects the respiratory tract, it was observed that many systems were affected. The gastrointestinal system is one of the main systems involved. The aim of this manuscript was to perform epidemiological, virological, and clinical analysis of 59 Covid 19-positive patients with gastrointestinal symptoms.

Method: Covid-19 diagnosed patients have been started to be admitted since March, 20, 2020. Epidemiological, demographical, clinical findings, laboratory analyses as well as hospitalization periods and disease progression of the patients presenting gastrointestinal system (GIS) symptoms admitted between March, 31, 2020 and August, 1, 2020.

Results: Totally 710 Covid 19-positive patients hospitalized were screened. Among these patients, those with incomplete medical history and deficient data were excluded. The analysis of 281 patients admitted due to Covid-19 diagnosis with complete data since admission revealed that 59 patients presented GIS symptoms at admission. The aforesaid patients were compared with 222 patients admitted due to Covid-19 without GIS symptoms within the same period. GIS symptoms were detected on 59 (59/281) (20.99%) patients admitted due to Covid-19. Detailed review of these patients revealed that 18 (18/59) (30.50%) patients had nausea-vomiting, 10 (10/59) (16.95%) patients had abdominal pain, and 31 (31/59) (52.55%) patients had GIS bleeding. It was observed that vomiting was added into the clinical presentation in 7 of 18 patients. Although there is not any diarrhea symptom alone, total number of cases with diarrhea+abdominal pain, diarrhea+nausea-vomiting, diarrhea+nausea-vomiting+abdominal pain was 17 (17/59) (28.81%) of 59 patients.

Conclusion: According to the results of this study, we have found 20.99% gi symptoms in the hospitalized patients due to Covid 19. Although GIS symptoms are not associated with disease severity, they are important for the identification and spread of the disease, along with respiratory symptoms.

Keywords: Covid 19, gastrointestinal symptoms, prognosis

ÖZ

Amaç: SARS COV-2 virusunun yaptığı hastalık olarak tanımlanan Covıd-19 başta solunum yolunu etkilemekle birlikte pek çok sistemi de etkisi altına aldığı görülmüştür. Gastrointestinal sistem (GİS) başlıca tutulan sistemlerdendir. 59 gastrointestinal semptomlu Covid 19 pozitif hastanın epidemiyolojik, virolojik, klinik analizi yapılması amaçlanmıştır.

Yöntem: Covid-19 tanılı hastalar hastanemizde 20 Mart 2020 itibari ile yatırılmaya başlanmıştır. 31 Mart 2020-1 Ağustos 2020 tarihleri arasında hastaneye yatan Covid-19 tanılı hastaların arasından GİS semptomları olan hastaların epidemiyolojik, demografik, klinik, labarotuvar, analizleri ile birlikte hastaneye yatış süreleri, hastalık seyirleri değerlendirmeleri yapılmıştır.

Bulgular: Toplamda 710 Covid-19 Pozitif yatan hasta taranmıştır. Bu hastalar içinde; anamnezleri tam olmayan, veri eksikleri bulunan hastalar çalışmaya alınmamıştır. Hastaneye yatışından itibaren tüm verileri tam olan 281 Covid-19 tanılı yatan hastanın yapılan analizinde; 59 hastanın hastalık başvurusu sırasında gis semptomları gösterdiği saptanmıştır. Aynı tarihler arasında covid-19 tanısı ile yatışı yapılmış gis semptomu göstermeyen 222 hasta ile karşılaştırılmıştır. Covid-19 tanılı yatan hastaların toplamda 59 (59/281) (%20.99) unda gıs semptomları görüldü. Bu hastalar detaylı olarak incelendiğinde; 18 (18/59) (%30.50) hastada bulantı- kusma, 10 (10/59) (%16.95) hastada karın ağrısı, 31(31/59)(%52.55) hastada gis kanama görüldüğü saptandı. Bulantı görülen 18 hastanın, 7'sinde kusmanın da eklendiği izlendi. Tek başına ishal semptomu olmamakla birlikte, 59 hasta içinde; ishal+karın ağrısı, ishal+bulantı- kusma, ishal+bulantı-kusma+karın ağrısı görülen vakaların toplam sayısı 17 (17/59) (%28.81) idi.

Sonuç: Elde ettiğimiz verilere göre GİS semptomları %20,99 oranında görülmektedir. Solunumsal semptomlar sonrasında ikinci sıklıkta görülmeye başlanan GİS semptomları, hastalığın tanımlanmasında ve seyrinde önem taşımaktadır.

Anahtar kelimeler: Covid-19, gastrointestinal semptomlar, prognoz

INTRODUCTION

The SARS CoV 2 infection appeared in Wuhan city of China by December has been declared as pandemic virus and affected the globe. This infection which has been denominated as Covid-19 infected 109,735,851 individuals, caused 2,420,401 deaths, and 84,299,843 individuals recovered [1]. Turkey has been in the 9th country with 2,594,128 cases [1].

The SARS CoV 2 was associated with respiratory tract infection when detected first; it enters into the cells through angiotensin converting enzyme 2 (ACE 2)[2]. It has been currently determined that the ACE 2 receptor is highly expressed in the epithelial cells of the gastrointestinal system (gis) [3]. Therefore, it may be said that the gastrointestinal tract may host SARS-CoV-2 for active infection and replication. Although respiratory symptoms such as fever and dry cough are observed, many patients also experience gastrointestinal symptoms such as diarrhea, nausea, vomiting, and abdominal pain [4]. Updated data suggest that SARS-CoV-2 RNA may be isolated from anal/rectal smears and stool [5,6]. Hypotheses on possible gastrointestinal system infection through fecal-oral route have appeared.

The aim of the present study was to analyze laboratory, clinical and epidemiological data as well as gastrointestinal symptom prevalence among patients admitted within a 4-month period in our hospital declared as pandemic hospital where we could monitor Covid-19 patients.

MATERIAL and METHODS

Study design and participants
Patients who have been admitted to Covid-19 pandemic clinic of Tepecik Research and Training Hospital between March, 31, 2020 and August, 1, 2020 were screened retrospectively from the patient recording system. Adult patients who have been diagnosed with Covid-19 through real-time reverse transcription (RT-PCR) from nasopharyngeal smears were included in the study. Clinical status, laboratory and epidemiological data, concomitant diseases, treatment patterns, and prognosis of the patients were analyzed. Patients who have undergone computed tomography scan of thorax were classified according to tomography findings. Images were restructured with 1.5 or 1 mm slice thickness and 1.5 or 1 mm slice range. Reconstructed images were forwarded to the work station and image archiving and communication systems (PACS) for processing after multi-plane reconstruction. Multiple, bilateral frosted glass opacities, cobblestone finding, peripheral consolidation, air bronchogram, reverse halo/peri-lobular pattern dominantly detected on the lower lobe and periphery were evaluated as definite CT findings for covid. CT findings were evaluated by Radiologists and classified according to our national covid guidelines published by the ministry of health and the classification of Britain imaging association [7,8]. Furthermore, gastrointestinal symptoms as well as symptoms such as fever, shortness of breath and cough were screened from their medical histories. The patients were divided into two groups as GIS symptom positive and GIS symptom negative. The patients were also identified according to the following criteria as mild-moderate or severe pneumonia [7].

Mild to moderate pneumonia criteria:
a. Fever, muscle/joint pain, cough and sore throat, respiratory count below 30/min, SpO_2 level at room air above 90%; and
b. Findings for mild to moderate pneumonia in the lung X-ray or tomography.

The possible case considered as mild pneumonia with following criteria:
» poor prognostic findings in blood analysis at referral (blood lymphocyte count <800/μl or CRP > 10 x upper limit of normal value or ferritin >500 ng/ml or D-Dimer >1000 ng/ml, etc.); AND
» Respiration count <24/minute, SpO_2 level at room air above 93%; AND
» Bilateral diffuse involvement (>50%) in lung imaging.

These patients should be treated by hospitalization. Severe pneumonia criteria:

a. Fever, muscle/joint pain, cough and sore throat, tachypnea (≥30/min), SpO_2 level at room air ≤90%; and

b. Findings for bilateral diffuse pneumonia in the lung X-ray or tomography.

The approval of ministry of health was obtained through the approval code of 2020-05-16T22 30 15. The study was approved by Ethical Committee of Tepecik Training and Research Hospital with 2020-10/22 approval number.

Statistical analysis:

All statistical analyses were performed through The Statistical Package for Social Sciences 23.0 (SPSS 23.0, Chicago, IL, USA) software. The data collected within the scope of the study were summarized as mean±standard deviation. In data analysis; When the parametric test prerequisites are met, "One-way analysis of variance: ANOVA"; when not provided, the "Kruskal Wallis" test was used. Fisher's Exact test or Pearson Chi-Square test was used in the analysis of categorical data. A value of $p<0.05$ was considered statistically significant.

RESULTS

Totally 710 Covid 19-positive patients hospitalized were screened. Among these patients, those with incomplete medical history and deficient data were excluded. The analysis of 281 patients admitted due
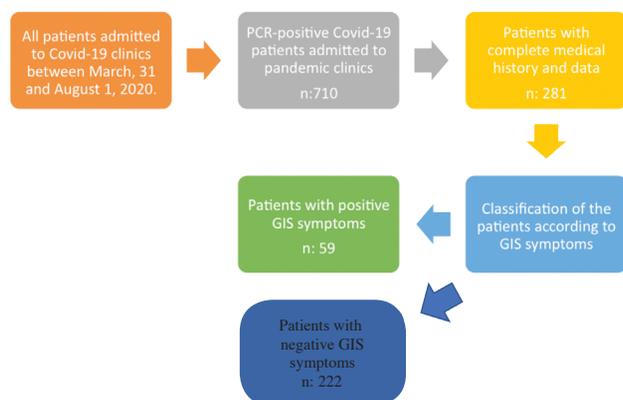

Figure 1. Patients analyzing pathway scheme.

to Covid-19 diagnosis with complete data since admission revealed that 59 patients presented GIS symptoms at admission. The aforesaid patients were compared with 222 patients admitted due to Covid-19 without GIS symptoms within same period (Figure 1).

Age average of Covid-19-positive patients with GIS symptoms: 56.0±14.8. Age average of Covid-19-positive patients without GIS symptoms: 50.0±17.2. Age average of 281 patients admitted due to Covid-19: 52.1±17.0. Comparison of age average of the patients revealed that there was not any difference between patients with and without GIS symptoms.

Gender analysis of the patients revealed that 59 Covid-19 patients with GIS symptoms included 31 (52.5%) females and 28 (47.5%) males. Two hundred and twenty two Covid-19 patients without GIS symptoms included 116 (52.25%) males and 106 (47.75%) females. Two hundred and eighty one patients admitted due to Covid-19 included 137 (48.75%) females and 144 (51.25%) males. Those with GIS symptoms were dominantly female; however, males were more in patients without GIS symptoms.

Referral findings of the patients including fever, cough, diarrhea, nausea, vomiting, abdominal pain, and GIS bleeding were evaluated.

GIS symptoms were detected on 59 (59/281) (20.99%) patients admitted due to Covid-19. Detailed review of these patients revealed that 18 (18/59) (30.50%) patients had nausea-vomiting, 10 (10/59) (16.95 %) patients had abdominal pain, and 31 (31/59) (52.55%) patients had GIS bleeding. It was observed that vomiting was added into the clinical presentation in 7 of 18 patients. Although there was not any diarrhea symptom alone, total number of cases with diarrhea+abdominal pain, diarrhea+nausea-vomiting, diarrhea+nausea-vomiting+abdominal pain was 17 (17/59) (28.81%) of 59 patients.

Fever was identified as body temperature over 37.5^0 C through a digital thermometer [9]. Accordingly,

among Covid-19 patients with GIS symptoms admitted, 26 (44.06%) had fever, and 33 (55.94%) had no fever. Among Covid-19-positive patients without GIS symptoms admitted, 135 (60.81%) had no fever; however, 87 (39.19%) patients presented fever. There was not any statistically significant difference between the groups for fever in inter-group evaluation.

Among Covid-19-positive patients with GIS symptoms admitted, 32 (54.24%) had cough, and 27 (45.76%) patients had no cough. Among Covid-19-positive patients without GIS symptoms admitted, 130 (58.55%) had no cough; however, 92 (41.45%) patients presented cough. There was not any statistically significant difference between the groups for cough in inter-group evaluation (Table 1).

Table 1. Analysis of 281 patients according to the first hospitalization findings.

Findings at the application	Present	Absent
Fever	113	168
Shortness Of Breath	71	210
Cough	124	157
Nausea	18	263
Vomiting	7 (of 18 patients with nausea)	275
Abdominal Pain	10	271
GIS Bleeding	31	250

Shortness of breath
There was not any statistically significant difference between the groups with and without GIS symptoms for shortness of breath in inter-group evaluation.

Concomitant diseases of the patients;

Diabetes mellitus (DM):
Among Covid-19-positive patients with GIS symptoms admitted, 10 (16.95%) had DM, and 49 (83.05%) patients had no DM.

Among Covid-19-positive patients without GIS symptoms admitted, 195 (87.84%) patients were not diagnosed with DM; however, 27 (12.16%) patients were diagnosed with DM. There was not any statistically significant difference between the groups for DM in inter-group evaluation.

Hypertension (HT):
Among Covid-19-positive patients with GIS symptoms admitted, 22 (37.29%) had HT, and 37 (62.71%) patients had no HT.

Among Covid-19-positive patients without GIS symptoms admitted, 168 (75.68%) patients were not diagnosed with HT; however, 54 (24.32%) patients were diagnosed with HT. There was not any statistically significant difference between the groups for HT in inter-group evaluation.

Chronic Obstructive Pulmonary Diseases (COPD):
Among Covid-19-positive patients with GIS symptoms admitted, 12 (20.34%) had COPD, and 47 (79.66%) patients had no COPD.

Among Covid-19-positive patients without GIS symptoms admitted, 207 (93.24%) patients were not diagnosed with COPD; however, 15 (6.76%) patients were diagnosed with COPD. There was a statistically significant difference between the groups for COPD in inter-group evaluation (p:0.003). It was observed that COPD diagnosis was more in patients with GIS symptoms.

Coronary artery disease (CAD):
Among Covid-19-positive patients with GIS symptoms admitted, 28 (47.46%) had CAD, and 31 (52.54%) had CAD.

Among Covid-19-positive patients without GIS symptoms admitted, 156 (70.27%) patients were not diagnosed with CAD; however, 66 (29.73%) patients were diagnosed with CAD.

There was a statistically significant difference between the groups with and without GIS symptoms for CAD in inter-group evaluation (p:0.000). CAD was detected more in those without GIS symptoms.

Analysis of laboratory values of the patients with and without gastrointestinal symptoms; there was not any statistically significant difference between

leukocyte count, lymphocyte count, hemoglobin, and hematocrit values (Table 2).

Table 2. Hemogram parameters according to the Gi symptom positive or negative.

	GIS symptom negative	GIS symptom positive	P Value
Leukocyte	8297±7065	7596±3473	P>0.05
Neutrophile	5776±6858	5100±2924	P>0.05
Lymphocyte	1648±1016	1610±1711	P>0.05
Hb	13.3±1.91	13.7±4.7	P>0.05
Hct	39.6±5.2	39.9±8.74	P>0.05
Plt	237797±94166	214355±67313	P:0.032

However, platelet levels were detected lower than patients with GIS symptoms than those without GIS symptoms (p:0.032).

There was not any statistically significant difference between patients with and without GIS symptoms for biochemical parameters including ALT, AST, LDH, GGT, ALP, T. BIL, D. BIL., albumin, D-DIMER, fibrinogen, ferritin (Table 3).

Review of inflammation-associated markers and coagulation values revealed no statistically significant difference between the groups with and without GIS symptoms (Table 3).

Table 3. Hemogram parameters according to the Gi symptom positive or negative.

	GIS symptom negative	GIS symptom positive	P Value
ALT	29.2±28.8	28.6±20.2	P>0.05
AST	34.8±62.3	30.4±15.2	P>0.05
LDH	262±136	288±132	P>0.05
GGT	29.4±24.6	55.2±49.2	P>0.05
ALP	76.3±30.2	73.3±45.3	P>0.05
T.BIL	0.69±0.99	0.74±0.63	P>0.05
D.BIL	0.12±0.10	0.15±0.18	P>0.05
ALBUMIN	3.9±0.57	3.74±0.64	P>0.05
D-DIMER	1022±1585	1460±1823	P>0.05
FIBRINOGEN	393±162	406±128	P>0.05
FERRITIN	213±586	191±195	P>0.05
CRP	39.1±60.3	54.6±80.7	NS
PROCALCITONIN	0.47±5.06	0.26±0.85	NS
APTT	25.7±3.71	24.7±3.31	NS
PTZ	13.3±3.42	13.1±3.88	NS
INR	1.11±0.27	1.09±0.34	NS

Thoracic Computed Tomography (CT) scans taken revealed that pneumonia was not detected in 18 cases, pneumonia was detected in 29 cases, and 12 cases presented indefinite pneumonia findings. Among 29 patients with pneumonia, 13 patients had mild to moderate, and 16 patient presented severe pneumonia (Table 4).

Table 4. CT findings according to the Gi symptoms.

	GIS symptom ABSENT	GIS symptom PRESENT
Pneumonia absent	73	18
Pneumonia mild/moderate	58	13
Pneumonia severe	71	16
Indefinite	19	12
TOTAL	221	59

Classification of pneumonia severity depending on the criteria as mild, moderate and severe pneumonia revealed that pneumonia was detected in 41 patients with GIS symptoms, and 148 patients without GIS symptoms. There was not any statistically significant difference.

Among 29 patients with GIS symptom and pneumonia; 13 patients had mild to moderate, and 16 patients had severe pneumonia.

Among those with pneumonia and without GIS symptoms; 58 patients had mild to moderate, and 71 patients had severe pneumonia.

There was not any significant difference between two groups for mild to moderate and severe pneumonia (p>0.05) (Table 5).

Table 5. Pneumonia Severty According To The Symptoms.

	Nausea	Vomiting	Abdominal pain	GIS bleeding	Diarrhea
Pneumonia absent	7	5	0	7	7
Pneumonia mild/moderate	3	0	4	9	3
Pneumonia severe	5	1	6	5	6
Indefinite	3	1	0	10	1
TOTAL	18	7	10	31	17

Among the patients with nausea, 3 patients had mild to moderate pneumonia whereas 5 had severe pneumonia.

None of the patients with vomiting presented with mild to moderate pneumonia. One patient presented severe pneumonia.

Among the patients with abdominal pain, 4 patients had mild to moderate pneumonia whereas 6 had severe pneumonia.

Among the patients with diarrhea, 3 patients had mild to moderate pneumonia whereas 6 had severe pneumonia.

Among the patients with GIS bleeding, 9 patients presented mild to moderate pneumonia whereas 5 had severe pneumonia.

No statistically significant difference was detected between GIS symptoms and severity of pneumonia. Mean and median hospitalization period in patients with GIS symptoms were 8.84±7.29, and 7.00 (min 3-max 50) days, respectively. Mean and median hospitalization period in patients without GIS symptoms were 8.58± 6.9, and 7.00 (min 1-max 50) days, respectively. There was not any statistically significant difference between two groups for hospitalization periods; p>0.05.

No death was observed among the patients monitored.

DISCUSSION

Covid-19 with higher mortality and morbidity rates has taken its place in world history as the new coronavirus that causes acute respiratory infection. It was initially defined with respiratory symptoms only, it was understood that the virus and the disease it caused were better understood and had an affinity for the gastrointestinal system with more experience and could settle here as well. Along with slow decoding of Covid-19 with non-clarified issues, new system involvements have emerged. One of the aforesaid issues, the gastrointestinal involvement, may appear with diarrhea, loss of appetite, abdominal pain, nausea and vomiting. Furthermore, fecal-oral spread was considered after detection of the virus RNA in the stool.

Initial studies conducted on Covid-19 revealed GIS symptom rated between 2% and 10%; however, such rate has increased after better understanding the damage caused by the virus [10-14].

Jin X et al. [15] detected GIS symptom rate on 651 patients as 11.4%. Similar to the study above, Lin Lu et al. [16] conducted a study on 95 patients, and detected GIS symptoms in 11.6% of the patients. Zhou Z et al. [17] detected the GIS symptoms in approximately 26% of the patients in their study conducted on Covid-19 patients.

In the light of the results obtained by screening 710 patients in our study; GIS symptoms were detected in 59 of 281 patients with complete data, and this rate was found to be 20.99%. However, if data and medical history data were written completely, the rate would increase to 26% like the study conducted by Zhou et al. [17].

The age average of the patients with GIS symptoms was 56.0 ± 14.8 years. There was not any statistically significant difference detected when compared to those without GIS symptoms. Similar to the studies conducted by Lun Li et al. [15] and Jin X et al. [16] the age averages were found 41.1±19.5 and 46.14±14.9 years, respectively. Similar to our study, no statistical difference was found between the groups with and without GIS symptoms in these two studies.

It is known that Covid-19 infection is generally more severe in men [18]. In the study of Lin L et al. [15] female gender was dominant in patients with GIS symptoms; however, no statistical difference was observed. In the study by Jin x et al. [16] both gender rates were found to be equal. In our study, the female gender was dominant; however, as in the study of Lin l et al., no statistically significant difference was found.

A meta-analysis including 38 studies and 3,062 patients with Covid-19 revealed that respiratory

failure or ARDS incidence was 19.5% and death rate was 5.5% in Covid-19 symptom analysis. Considering the frequency of symptoms from most common to the rarest included fever (80.4%), fatigue (46%), cough (63.1%) and expectoration (41.8%), muscle soreness (33%), anorexia (38.8%), chest tightness (35.7%), shortness of breath (35%), dyspnea (33.9%). nausea and vomiting (10.2%), diarrhea (12.9%), headache (15.4%), pharyngalgia (13.1%), shivering (10.9%), and abdominal pain (4.4%). The rate of asymptomatic patients was 11.9% [18].

In an article including 1,602 patients from 10 studies; diarrhea (average 5.6%; range 2%-33.98%) was detected in 55 patients; and the presence of nausea-vomiting symptoms in 72 patients (average 4.49%; range 1%-10%) was reported [19]. The studies included in this review were usually small case-based studies.

Considering the studies involving cases with wider GIS symptoms; the study of Jin X et al., diarrhea was the most common symptom with a rate of 8.14% [15]. In the study of Lin Li et al. for the case analysis including 58 patients with GIS symptoms, following rates were detected; diarrhea by 24.2%, nausea by 17.9%, anorexia by 17.9%, vomiting by 4.2%, acid reflux by 2.1%, and GIS bleeding by 2.1% [16]. In the present study, among 59 patients with GIS symptoms, GIS bleeding was detected in 52.55%, nausea-vomiting was detected in 30.50% of the patients, and abdominal pain was detected in 16.95% of the patients. It was observed that vomiting was added into the clinical presentation in 7 of 18 patients. Although there was not any diarrhea symptom alone, among 59 patients; patients with diarrhea+abdominal pain, diarrhea+nausea-vomiting, diarrhea+nausea-vomiting+abdominal pain was 28.81% of total number of cases. Similar to our study, the rates of diarrhea (21.12%, 20.14% and 23.6%, respectively) were similar in the studies of Wan Y, et al., Nobel Y, et al, Booth CM et al [20-22].

The nausea-vomiting rates (22.67%) in the study conducted by Nobel et al. [21] from the United States revealed similar rates for nausea-vomiting with our study. However, lower rates were detected in other studies.

It was noteworthy that unlike other studies, the rate of GIS bleeding was higher in our study. It was considered that this situation might have caused by the drugs used, stress state and comorbidity. Furthermore, it was thought that platelet values found to be lower in the group with GIS symptoms when compared to the group without gis symptoms, and this may cause tendency to bleeding with anticoagulant and anti-aggregant drugs administered during Covid-19 treatment.

When compared in terms of laboratory values, there was no difference between biochemical parameters and inflammation markers between the groups with and without GIS symptoms. In the study conducted by Lin L et al., [16] 32.6% of patients had a deterioration in hepatic transaminase values with an increase in bilirubin, aspartate transaminase and alanine aminotransferase. The deterioration in transaminase values was mostly associated with the drugs used by the patients during treatment; however, it was not associated with the intensity or presence of GIS symptoms. Similar to our study, Jin X et al. [15] did not find a statistically significant difference in laboratory values between the groups with and without symptoms. However, they stated a significant difference between two groups for electrolyte imbalance.

Classification of pneumonia severity depending on the computed tomography criteria as mild, moderate and severe pneumonia revealed that pneumonia was detected in 41 patients with GIS symptoms, and 148 patients without GIS symptoms. There was not any statistically significant difference. Furthermore, there was not any significant difference between the two groups in terms of hospital stay. It was observed that COPD diagnosis was more in patients with GIS symptoms in our study. However, similar to the study of Lin L et al. [16], no difference was found between the groups with and without GIS symptoms for

pneumonia disease severity and clinical course in our study.

Our study included some limitations.

Because it is a retrospective study that included a short interval, the data could be edited in the light of the information contained in the patient files. Therefore, detailed analysis of GIS symptoms of the patients could only be performed as much as the information available in the file. Since fecal viral RNA analysis could not be performed in our hospital, the relationship between virus fecal excretion and GI symptoms could not be investigated. Faecal oral transmission or virus spread or virus density in patients with diarrhea could therefore not be detected.

CONCLUSION

According to the results of this study, we have found 20.99% gi symptoms in the hospitalized patients due to Covid 19. The importance of GI symptoms in clinical practice should not be underestimated. Understanding the diverse sensitivity of the individual GI system to SARS-CoV-2 would encourage personalized Covid-19 treatment. It should be considered that viral gastrointestinal infection and potential fecal-oral transmission may persist even after viral clearance from the respiratory tract before discharge.

REFERENCES

1. World Health Organisation. www.who.int.
2. Wu F, Zhao S, Yu B, Chen YM, Wang W, Song ZG et al. A new coronavirus associated with human respiratory disease in China. Nature. 2020;579:265-9. [CrossRef]
3. Xiao F, Tang M, Zheng X, Liu Y, Li X, Shan H. Evidence for gastrointestinal infection of SARS-CoV-2. Gastroenterology 2020;158(6):1831-3. [CrossRef]
4. Gu J, Han B, Wang J. COVID-19: Gastrointestinal manifestations and potential fecal-oral transmission. Gastroenterology 2020;158(6):1518-9. [CrossRef]
5. Zhang W, Du RH, Li B, Zheng XS, Yang XL, Ben Hu et al. Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes. Emerg. Microbes. Infect. 2020;9:386-9. [CrossRef]
6. Xu Y, Li X, Zhu B et al. Characteristics of pediatric SARS-CoV-2 infection and potential evidence for persistent fecal viral shedding. Nat Med. 2020;26:502-5. [CrossRef]
7. Reference: ministry of health, Republic of Turkey Ministry of Health, General Directorate of Public Health, COVID-19 (SARS-CoV-2 Infection) Guide, Science Committee study, Ankara April 14, 2020.
8. COVID-19 BSTI Statement and Guidance. COVID-19. Statement from the British Society of Thoracic Imaging (BSTI). https://www.bsti.org.uk/training-and-education/covid-19-bsti-imaging-database).
9. Bartfai T, Conti B. Fever. Review Scientific World Journal. 2010;10:490-503. [CrossRef]
10. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet. 2020;395:497-506. [CrossRef]
11. 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. The Lancet. 2020;395:507-13. [CrossRef]
12. 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):1061-9. [CrossRef]
13. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med. 2020;382:727-33. [CrossRef]
14. Guan W-jie, Ni Z-yi, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med. 2020;382:1708-20. [CrossRef]
15. Jin X, Lian JS, Hu JH, et al. Epidemiological, clinical and virological characteristics of 74 cases of coronavirus- infected disease 2019 (COVID-19) with gastrointestinal symptoms. Gut. 2020;69(6):1002-9. [CrossRef]
16. Lin L, Jiang X, Zhang Z et al. gastrointestinal symptoms of 95 cases with SARS-CoV2 infection. Gut. 2020;69:997-1001. [CrossRef]
17. Zhou Z, Zhao N, Shu Y, Han S, Chen B, Shu X. Effect of Gastrointestinal Symptoms on Patients Infected With Coronavirus Disease 2019. Gastroenterology. 2020;158(8):2294-7. [CrossRef]
18. Zhu J, Ji P, Pang J, Zhong Z, Li H, He C et al. Clinical characteristics of 3062 COVID-19 patients: A meta-analysis. Meta-Analysis J Med Virol. 2020;92(10):1902-14. [CrossRef]
19. Li LY, Wu W, Chen S, Gu JW , Li XL, Song HJ. Digestive system involvement of novel coronavirus infection: prevention and control infection from a gastroenterology perspective. J Dig Dis. 2020;21(4):199-204. [CrossRef]
20. Wan Y, Li J, Shen L, et al. Enteric involvement in hospitalised patients with COVID-19 outside Wuhan. Lancet Gastroenterol Hepatol. 2020;5(6):534-5. [CrossRef]
21. Nobel Y, Phipps M, Zucker J, et al. Gastrointestinal Symptoms and COVID-19: Case-Control Study from the United States. Gastroenterology. 2020;159(1):373-5. [CrossRef]
22. Booth CM, Matukas L, Tomlinson G, et al. Clinical features and short-term outcomes of 144 patients with SARS in the greater Toronto area. JAMA. 2003;289(21):2801-9. [CrossRef]