

RESEARCH ARTICLE

Comparative Study on Clinical Characteristics of COVID-19 Patients With or Without Digestive Symptoms in Razi Hospital, Ahvaz, Khuzestan

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Abstract: Background: Most commonly reported clinical manifestations are fever, fatigue and dry cough. Interestingly, a small percentage of patients experience GI symptoms, with the most common being anorexia, diarrhea, nausea and vomiting. We aimed to conduct a comparative study on COVID-19 patients with or without gastrointestinal patients (GI).

Aims: The pandemic of coronavirus disease 2019 (COVID-19) has emerged as a dire health problem, causing a massive crisis for global health.

Methods: Collective data of clinical manifestations and laboratory reports of patients admitted to Razi Hospital, Ahvaz, Khuzestan, Iran, for two weeks were analyzed.

Results: Our results showed that GI symptoms are not statistically significant criteria to be predictive or prognostic factors in COVID-19 patients, although they are probably related to the acute or non-acute phase of the disease. Moreover, non-specific GI symptoms seem to result from cytokine storm that occurred during the disease.

Conclusion: Therefore, our results did not support GI tract involvement as a common route of COVID-19 infection. Maybe future research will shed light on why and how the gastrointestinal system becomes infected by COVID-19.

Keywords: COVID-19, gastrointestinal, diabetes, cytokine, fever, digestive symptoms.

1. INTRODUCTION

The new coronavirus-caused respiratory disease known as coronavirus disease 2019 (COVID-19) spread through the world in December, 2019 [1, 2]. Among patients with COVID-19, the most significant risk factors are the patient's age and underlying diseases (particularly hypertension and diabetes). The manifestation of COVID-19 varies from asymptomatic to serious clinical complications, which involve multiple organs [3]. The most commonly affected organ is the pulmonary tract manifesting respiratory symptoms, such as fever, cough, and shortness of breath. Although gastrointestinal (GI) signs, such as diarrhea, nausea, and vomiting [4, 5], neurological symptoms like cerebrovascular disease, impaired consciousness and muscle damage are also observed among COVID-19 patients [6, 7].

The presence of GI symptoms is considered to be of special significance in COVID-19-infected patients as they arise early and can worsen during disease progression [8-10]. According to an early study, the incidence of GI symptoms, such as diarrhoea, ranged from 1% to 3.8%. [11]. GI symptoms have also been noted to occur more frequently, with diarrhoea and nausea in 10.1% and vomiting in 3.6% of infected patients [12]. In the case of COVID-19 infection just by GI manifestation, it usually leads to a delay in diagnosis as well as a longer time to first respiratory symptoms, which can make patients a great source of viral dissemination. Thus, GI signs seem to be of special importance in COVID-19 [8]. In spite of the principal method for COVID-19 diagnosis, Reverse Transcriptase quantitative Polymerase Chain Reaction (RT-qPCR), on respiratory specimens [13], the virus is also detected in fecal [14], blood [15], and urine samples [16]. Chest CT scan is also sensitive for the diagnosis of COVID-19 and can be used as a primary tool [17].

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Based on previous studies, high neutrophil count and increased levels of serum amyloid A (SAA), procalcitonin (PCT), C-reactive protein (CRP), cardiac troponin I (cTnI), D-Dimer, and lactate dehydrogenase (LDH) can be used as indicators of disease progression [7]. In addition, the viral nucleic acid has been detected in more than 50% of patients with COVID-19. Gastrointestinal symptoms may manifest due to infection of enterocytes expressing angiotensin-converting enzyme 2 (ACE2), which is an entry receptor for the SARS-CoV-2 virus [18, 19]. Given that many SARS-CoV-2 infected patients may be detected solely based on respiratory symptoms, it is likely that patients without respiratory signs, especially those with gastrointestinal symptoms, will refer to medical centers later than other patients and have a delayed diagnosis [13]. This not only worsens the disease and results in poor prognosis but also enhances the probability of COVID-19 transmission. Therefore, in this study, we compare the clinical features and prognosis of COVID-19 patients with or without gastrointestinal symptoms in Razi Hospital in Ahvaz, Iran.

2. PATIENTS AND METHODS

2.1. Study Subjects

This retrospective descriptive, cross-sectional, and monocentric study involving 233 cases was conducted in Razi Hospital, Ahvaz, Iran, over a two-week period from April 27th to May 11th, 2021. The study included all patients with COVID-19 infection admitted to the hospital and confirmed by a real-time PCR on the nasopharyngeal swab, bronchoalveolar lavage, tracheal aspirate and oral or stomach swab. Clinical manifestations and laboratory reports were documented. Patients who did not meet the inclusion criteria were excluded from the study. Then, the consequences of each individual were followed.

2.2. Variables

We accumulated the information of patients regarding demographic data (such as age, gender, and smoking status), comorbidities (history of hypertension, diabetes, dyslipidemia, coronary artery disease, chronic obstructive pulmonary disease, and asthma), clinical characteristics including digestive symptoms (anorexia, nausea/vomiting, diarrhea, or abdominal pain), and other symptoms (fever, cough, expectoration, and dyspnea) at the time of discharge or deceased.

2.3. Ethical Issues

This study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran (IR.AJUMS.REC.1399.276). Details of the plan were described for all participants, and written consent was signed by individuals.

2.4. Statistical Analysis

The random survival forest technique was utilized to assess the impact of various variables at the time of death/discharge and time interval from admission to ICU. In this dataset, dying from COVID-19 and ICU hospitalization were

considered as the events. Moreover, discharge and not being hospitalized in ICU were assumed as the right censoring. When the number of covariates and factors far exceeds the number of observations, routine and standard survival analysis approaches, such as Cox's proportional hazard regression, do not result in adequate and reliable estimations [20].

To compare continuous variables of two groups (discharged and deceased), independent samples t-test was used. The independence between categorical variables and the outcome was checked by the chi-square or Fisher's exact test. To visualize the development of survival probabilities for the categories of gastrointestinal and respiratory symptoms, Kaplan-Meier curves were plotted. Moreover, the log-rank test was used to investigate the different levels of gastrointestinal and respiratory symptoms in terms of survival probabilities. To evaluate the unadjusted effects of gastrointestinal and respiratory symptoms presence/absence, odds ratio (95% confidence interval) estimates were reported in different levels of death/discharge variable.

3. RESULTS

Demographic data showed that out of 233 cases of COVID-19, 122 patients were men and 111 were women. Moreover, 44 patients (18.9%) died, and 188 individuals (81.1%) were discharged after recovery. It was observed that 39 cases (16.7%) were ICU admitted. The distribution of variables across the two groups of the deceased and the discharged is shown in Table 1. The odds ratio of death from COVID-19 was 4.78 times more among ICU cases than those who were not ICU-admitted.

It was shown that the presence of respiratory and gastrointestinal symptoms is not statistically associated with mortality. In contrast to the O₂ index, the mean of respiratory rate, age, aspartate aminotransferase (AST), AST/alanine aminotransferase (ALT), direct bilirubin, blood urea nitrogen (BUN), LDH, neutrophil, prothrombin time (PT), international normalized ratio (INR), and C-Reactive Protein (CRP) were significantly higher among group dying from COVID-19. Among ICU-admitted cases, the proportion between death and discharged patients were 17 (43.58%) and 22 (56.41%), respectively.

The distribution of presence/absence of respiratory and gastrointestinal symptoms among two groups of death/discharged individuals is shown in Tables 2 and 3. The time of admission to death/discharged and the respiratory rate were lower among those without respiratory symptoms; however, a similar comparison was statistically significant in cases who were discharged. Among the discharged cases, the mean values of BUN ($p = 0.019$) and blood platelet (PLT) ($p = 0.019$) were significantly lower and higher, respectively, in the positive respiratory symptoms group. In the deceased group, the mean value of phosphate (P) and creatine kinase (CK)-MB were respectively higher and lower for those without respiratory symptoms. The mean value of blood sugar (BS) and potassium (K) were significantly higher among those with gastrointestinal symptoms for both deceased and discharged cases.

Table 1. The distribution of variables across the two groups of dead and discharged patients.

		Death		OR (95% CI)	P-Value
		No	Yes		
ICU_Ad_status	No	167 (88.40%)	27 (61.40%)	4.78(1.05 - 3.7)	<0.001
	Yes	22 (11.60%)	17 (38.60%)	-	-
Gender	Female	95 (50.30%)	16 (36.40%)	1.77 (0.73 - 2.26)	0.096
	Male	94 (49.70%)	28 (63.60%)	-	-
Smoke	No	183 (96.80%)	42 (95.50%)	1.45 (0.3 - 4.62)	0.653
	Yes	6 (3.20%)	2 (4.50%)	-	-
Shortness of breath	No	66 (34.90%)	12 (27.30%)	1.43 (0.64 - 2.15)	0.333
	Yes	123 (65.10%)	32 (72.70%)	-	-
Cough	No	130 (68.80%)	33 (75.00%)	0.73 (0.47 - 1.64)	0.418
	Yes	59 (31.20%)	11 (25.00%)	-	-
Chest distress	No	187 (98.90%)	44 (100.00%)	1.06 (0.08 - 13.93)	0.99
	Yes	2 (1.10%)	0 (0.00%)	-	-
Pharyngodynia	No	181 (95.80%)	43 (97.70%)	0.53 (0.13 - 4.4)	0.543
	Yes	8 (4.20%)	1 (2.30%)	-	-
	Yes	134 (70.90%)	35 (79.50%)	-	-
Anorexia	No	136 (72.00%)	29 (65.90%)	1.33 (0.63 - 2.03)	0.427
	Yes	53 (28.00%)	15 (34.10%)	-	-
Nausea	No	150 (79.40%)	41 (93.20%)	0.28(0.21 - 1.61)	0.052
	Yes	39 (20.60%)	3 (6.80%)	-	-
Vomiting	No	157 (83.10%)	39 (88.60%)	0.63 (0.35 - 1.9)	0.363
	Yes	32 (16.90%)	5 (11.40%)	-	-
Diarrhea	No	171 (90.50%)	42 (95.50%)	0.45 (0.2 - 2.48)	0.288
	Yes	18 (9.50%)	2 (4.50%)	-	-
Loss of smell and taste	No	186 (98.40%)	44 (100.00%)	0.7 (0.07 - 10.68)	0.999
	Yes	3 (1.60%)	0 (0.00%)	-	-
Abdominal pain	No	182 (96.30%)	43 (97.70%)	0.6 (0.14 - 4.74)	0.639
	Yes	7 (3.70%)	1 (2.30%)	-	-
Dry mouth	No	189 (100.00%)	43 (97.70%)	8.79 (0.15 - 44.61)	0.189
	Yes	0 (0.00%)	1 (2.30%)	-	-
Heart burn	No	189 (100.00%)	43 (97.70%)	8.79 (0.15 - 44.61)	0.189
	Yes	0 (0.00%)	1 (2.30%)	-	-
Gastrointestinal_Symptoms_Number	0	95 (50.30%)	24 (54.50%)	-	0.949
	one symptom	54 (28.60%)	13 (29.50%)	0.95 (0.52 - 1.84)	-
	2 symptoms	26 (13.80%)	6 (13.60%)	0.91 (0.42 - 2.21)	-

(Table 1) contd....

		Death		OR (95% CI)	P-Value
		No	Yes		
-	-				
-	3 symptoms	10 (5.30%)	1 (2.30%)	0.4 (0.11 - 3.89)	-
-	4 symptoms	4 (2.10%)	0 (0.00%)	0.49 (0.06 - 8.87)	-
Gastrointestinal_Symptoms	No	95 (50.30%)	24 (54.50%)	0.84 (0.54 - 1.61)	0.62
-	Yes	94 (49.70%)	20 (45.50%)	-	-
Myalgia	No	141 (74.60%)	32 (72.70%)	1.1 (0.56 - 1.94)	0.798
-	Yes	48 (25.40%)	12 (27.30%)	-	-
Fever	No	100 (52.90%)	28 (63.60%)	0.64 (0.47 - 1.45)	0.198
-	Yes	89 (47.10%)	16 (36.40%)	-	-
Chills	No	124 (65.60%)	34 (77.30%)	0.56 (0.41 - 1.48)	0.136
-	Yes	65 (34.40%)	10 (22.70%)	-	-
Weakness	No	116 (61.40%)	26 (59.10%)	1.1 (0.6 - 1.82)	0.78
-	Yes	73 (38.60%)	18 (40.90%)	-	-
Lethargy	No	111 (58.70%)	23 (52.30%)	1.3 (0.65 - 1.94)	0.435
-	Yes	78 (41.30%)	21 (47.70%)	-	-
Headache	No	151 (79.90%)	40 (90.90%)	0.4 (0.27 - 1.66)	0.087
-	Yes	38 (20.10%)	4 (9.10%)	-	-
Dizziness	No	167 (88.40%)	38 (86.40%)	1.2 (0.48 - 2.43)	0.714
-	Yes	22 (11.60%)	6 (13.60%)	-	-
Sweating	No	186 (98.40%)	42 (95.50%)	2.95 (0.35 - 7.34)	0.223
-	Yes	3 (1.60%)	2 (4.50%)	-	-
Restlessness	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
Heartbeat	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
Loss of conscious	No	184 (97.40%)	40 (90.90%)	3.68 (0.57 - 5.49)	0.046
-	Yes	5 (2.60%)	4 (9.10%)	-	-
Tachycardia	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
Pregnancy	No	187 (98.90%)	44 (100.00%)	1.06 (0.08 - 13.93)	0.999
-	Yes	2 (1.10%)	0 (0.00%)	-	-
Seizure	No	187 (98.90%)	44 (100.00%)	1.06 (0.08 - 13.93)	0.999
-	Yes	2 (1.10%)	0 (0.00%)	-	-
Flushing	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
Cyanosis	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-

(Table 1) contd....

		Death		OR (95% CI)	P-Value
		No	Yes		
-	No	189 (100.00%)	43 (97.70%)	-	0.189
-	Yes	0 (0.00%)	1 (2.30%)	-	-
Drowsiness	No	111 (58.70%)	25 (56.80%)	1.08(0.59 - 1.8)	0.817
-	Yes	78 (41.30%)	19 (43.20%)	-	-
HTN	No	115 (60.80%)	26 (59.10%)	1.08 (0.59 - 1.81)	0.83
-	Yes	74 (39.20%)	18 (40.90%)	-	-
DM	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
PCI	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
ATN	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
PTE	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
uc	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
copd	No	188 (99.50%)	44 (100.00%)	2.14(0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
DKA	No	188 (99.50%)	44 (100.00%)	2.14(0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
Angiography	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
PCR	No	188 (99.50%)	43 (97.70%)	4.37 (0.18 - 19.62)	0.343
-	Yes	1 (0.50%)	1 (2.30%)	-	-
IHD	No	153 (81.00%)	35 (79.50%)	1.09 (0.52 - 2.06)	0.831
-	Yes	36 (19.00%)	9 (20.50%)	-	-
CVA	No	180 (95.20%)	44 (100.00%)	0.23 (0.05 - 5.79)	0.214
-	Yes	9 (4.80%)	0 (0.00%)	-	-
TB	No	189 (100.00%)	43 (97.70%)	8.79(0.15 - 44.61)	0.189
-	Yes	0 (0.00%)	1 (2.30%)	-	-
Hypothyroid	No	182 (96.30%)	43 (97.70%)	0.6(0.14 - 4.74)	0.639
-	Yes	7 (3.70%)	1 (2.30%)	-	-
Hyperthyroid	No	189 (100.00%)	43 (97.70%)	8.79 (0.15 - 44.61)	0.189
-	Yes	0 (0.00%)	1 (2.30%)	-	-
Anemia	No	188 (99.50%)	42 (95.50%)	8.95 (0.34 - 19.69)	0.092
-	Yes	1 (0.50%)	2 (4.50%)	-	-
Breast cancer	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-

(Table 1) contd....

		Death		OR (95% CI)	P-Value
		No	Yes		
-	-				
KTP	No	180 (95.20%)	44 (100.00%)	0.23 (0.05 - 5.79)	0.214
-	Yes	9 (4.80%)	0 (0.00%)	-	-
Autoimmune disease	No	184 (97.40%)	41 (93.20%)	2.69 (0.45 - 5.26)	0.171
-	Yes	5 (2.60%)	3 (6.80%)	-	-
Malignancy/ tumor	No	181 (95.80%)	44 (100.00%)	0.26 (0.05 - 6.15)	0.358
-	Yes	8 (4.20%)	0 (0.00%)	-	-
Heart failure	No	184 (97.40%)	42 (95.50%)	1.75 (0.31 - 5.18)	0.506
-	Yes	5 (2.60%)	2 (4.50%)	-	-
Seizure_A	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
Allergy	No	186 (98.40%)	44 (100.00%)	0.7 (0.07 - 10.68)	0.999
-	Yes	3 (1.60%)	0 (0.00%)	-	-
Renal stone	No	185 (97.90%)	43 (97.70%)	1.08 (0.16 - 6.59)	0.949
-	Yes	4 (2.10%)	1 (2.30%)	-	-
ESRD	No	179 (94.70%)	41 (93.20%)	1.31 (0.37 - 3.43)	0.691
-	Yes	10 (5.30%)	3 (6.80%)	-	-
Asthma	No	183 (96.80%)	44 (100.00%)	0.35 (0.06 - 7.17)	0.597
-	Yes	6 (3.20%)	0 (0.00%)	-	-
Airway disease	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-
Surgery	No	188 (99.50%)	42 (95.50%)	8.95 (0.34 - 19.69)	0.093
-	Yes	1 (0.50%)	2 (4.50%)	-	-
HLP	No	170 (89.90%)	41 (93.20%)	0.65 (0.29 - 2.4)	0.509
-	Yes	19 (10.10%)	3 (6.80%)	-	-
CABG	No	174 (92.10%)	41 (93.20%)	0.85 (0.32 - 2.73)	0.802
-	Yes	15 (7.90%)	3 (6.80%)	-	-
CKD	No	184 (97.40%)	44 (100.00%)	0.42 (0.06 - 7.92)	0.587
-	Yes	5 (2.60%)	0 (0.00%)	-	-
Parkinson's	No	189 (100.00%)	43 (97.70%)	8.79 (0.15 - 44.61)	0.189
-	Yes	0 (0.00%)	1 (2.30%)	-	-
Respiratory disease	No	187 (98.90%)	43 (97.70%)	2.17 (0.18 - 10.64)	0.52
-	Yes	2 (1.10%)	1 (2.30%)	-	-
Mental problems	No	189 (100.00%)	42 (95.50%)	18 (0.26 - 47.63)	0.095
-	Yes	0 (0.00%)	2 (4.50%)	-	-
IBD	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
-	Yes	1 (0.50%)	0 (0.00%)	-	-

(Table 1) contd....

		Death		OR (95% CI)	P-Value
		No	Yes		
Liver transplant	No	188 (99.50%)	44 (100.00%)	2.14 (0.08 - 24.13)	0.999
	Yes	1 (0.50%)	0 (0.00%)	-	-
CT	No	31 (16.40%)	4 (9.10%)	1.96 (0.53 - 3.36)	0.222
	Yes	158 (83.60%)	40 (90.90%)	-	-
A.V	No	69 (36.50%)	13 (29.50%)	1.37 (0.63 - 2.08)	0.384
	Yes	120 (63.50%)	31 (70.50%)	-	-
AB	No	102 (54.00%)	23 (52.30%)	1.07 (0.59 - 1.78)	0.839
	Yes	87 (46.00%)	21 (47.70%)	-	-
AF	No	188 (99.50%)	43 (97.70%)	4.37 (0.18 - 19.62)	0.259
	Yes	1 (0.50%)	1 (2.30%)	-	-
Corticosteroid	No	187 (98.90%)	44 (100.00%)	1.06 (0.08 - 13.93)	0.999
	Yes	2 (1.10%)	0 (0.00%)	-	-
Continuous Variables		Mean (SD)	Mean (SD)	-	P-Value
SA time	-	7.22 (5.35)	5.43 (3.53)	-	0.06
Ad_death_time	-	8.35 (4.39)	9.26 (4.53)	-	0.249
ICU_Adtime	-	7.46 (3.41)	7.82 (3.8)	-	0.749
Age	-	57.39 (16.64)	65.45 (13.62)	-	0.003
Respiratory rate	-	26.16 (7.89)	29.93 (11.02)	-	0.009
O2 index	-	89.77 (18.51)	83.04 (20.71)	-	0.038
AST	-	43.88 (34.37)	64.21 (76.47)	-	0.01
ALT	-	32.53 (62.7)	35.95 (69.46)	-	0.756
ASTALRatio	-	1.81 (0.77)	2.38 (1.32)	-	<0.001
Total bilirubin	-	1.16 (0.82)	1.27 (0.59)	-	0.417
Direct bilirubin	-	0.3 (0.26)	0.48 (0.64)	-	0.006
ALKP	-	203.98 (85.91)	224.82 (138.84)	-	0.23
Creatinine	-	2.34 (5.66)	3.41 (8.47)	-	0.319
BUN	-	27.48 (24.47)	42.33 (38.95)	-	0.002
LDH	-	553.05 (227.2)	707.56 (274.31)	-	<0.001
CK.MB	-	34.07 (63.96)	50.32 (57.47)	-	0.154
WBC	-	8.97 (12.51)	8.82 (5.49)	-	0.938
Neutrophil	-	62.19 (26.47)	72.35 (20.35)	-	0.026
Lymphocyte	-	20.59 (13.89)	17.81 (10.95)	-	0.244
RBC	-	4.36 (1.5)	4.17 (0.91)	-	0.449
Hb	-	12.54 (6.93)	12.45 (3.21)	-	0.935
HCT	-	34.55 (6.73)	35.72 (9.4)	-	0.362
PLT	-	205.54 (93.17)	194.24 (104.01)	-	0.49

(Table 1) contd....

		Death		OR (95% CI)	P-Value
		No	Yes		
Continuous Variables		Mean (SD)	Mean (SD)	-	P-Value
PT	-	13.19 (3.22)	14.61 (6.18)	-	0.046
PTT	-	38.08 (18.23)	38.53 (17.34)	-	0.892
INR	-	1.22 (0.68)	2.25 (4.61)	-	0.006
ESR	-	57.29 (29.88)	54.19 (31.92)	-	0.578
crp	-	45.02 (28.84)	61.18 (26.46)	-	0.002
BS	-	175.21 (108.44)	191.31 (114.8)	-	0.396
Na	-	143.76 (93.23)	136.14 (7.28)	-	0.594
K	-	4.52 (0.71)	4.49 (0.61)	-	0.794
Ca	-	8.27 (0.96)	8.4 (0.81)	-	0.422
P	-	3.75 (2.28)	4.07 (2.14)	-	0.441

The Kaplan-Meier curve for respiratory and gastrointestinal symptoms is shown in Fig. 1. The survival rate of cases with and without respiratory symptoms was 18.25 ± 1.24 days and 17.27 ± 1.25 days, respectively. The log-rank test showed no statistical difference in the survival curve of the two groups (log-rank = 0.315, p -value = 0.575). The survival rate of individuals with and without gastrointestinal symptoms was 15.34 ± 0.55 and 18.51 ± 1.35 , respectively, and the log-rank test showed no difference in the survival curve of the two groups (log-rank = 0.063, p -value = 0.801).

The results of random survival forest are shown in Figs. (2 and 3) so that the order of most significant variables can be presented. As shown in Fig. (2), the most significant variables affecting death/discharged patients due to COVID-19 were partial thromboplastin time (PTT), respiratory rate, neutrophil, surgery, direct bilirubin, hematocrit (HCT), phosphorus (P), AST/ALT, age, and Parkinson's disease, respectively. However, the most significant factors affecting ICU admission followed by COVID-19 were respiratory rate, O₂ index, breast cancer, lymphocytes, once admission, CRP, neutrophil, pulmonary thromboendarterectomy (PTE), LDH, and AST/ALT.

4. DISCUSSION

COVID-19 infection manifests a wide spectrum of signs according to various studies since the disease outbreak [3-6]. GI symptoms are one of special significance in COVID-19 patients as, in contrast to other coronaviruses, they appear sooner and may worsen the symptoms of the infection [10]. Patients who manifest only GI symptoms might be followed

by respiratory symptoms and with a delay in disease diagnosis. This can make patients a blurred source of viral dissemination [8]. In our study, we first compared some important variables between the two groups of patients who were discharged or deceased after a while. Our results indicated an 18.9% mortality rate for COVID-19 and a 1:4.2 mortality/discharge ratio in COVID-19 patients, which was close to some studies [21] but higher than some others [22]. This may be justified by a hypothesis that different variants of coronavirus can affect individuals living in different countries; therefore, various outcomes may have occurred following COVID-19 infection.

In our study, not only the rate of O₂ index, the mean respiratory rate, and the age of patients, but also the rates of laboratory findings, including AST, AST/ALT, direct bilirubin, BUN, LDH, neutrophil, PT, INR, and CRP values were significantly higher among the deceased group due to COVID-19. Similar results have also been shown in many other studies [23-31]. Some of these criteria belong to the acute phase of infection, and some others change over time; thus, they could be considered predictors of chronic inflammation. Accordingly, it can be hypothesized that COVID-19 is potentially a subclinical chronic disease triggering an inflammation storm and leading to enhanced mortality. Based on previous studies [32-36], our analyzed data showed lower BUN and higher PLT among discharged cases which can be considered suitable prognostic factors. The platelet count may support the non-acute phase of the COVID-19 disease. Also, the phosphorus and CK-MB levels in patients without respiratory symptoms were consistent with the previous literature [37-40].

Table 2. The distribution of presence/absence of respiratory symptoms in two levels of death/discharged patients.

		Death					
		No			Yes		
		Respiratory Symptoms			Respiratory Symptoms		
		No	Yes	OR (95% CI)	No	Yes	OR (95% CI)
		Count	Column N %	-	Count	Column N %	-
ICU_Ad_status	No	51(92.70%)	116(86.60%)	1.98(0.43 - 4.17)	8(88.90%)	19(54.30%)	6.74(0.26 - 20.31)
-	Yes	4(7.30%)	18(13.40%)	-	1(11.10%)	16(45.70%)	-
Gender	Female	25(45.50%)	70(52.20%)	0.76(0.47 - 1.67)	4(44.40%)	12(34.30%)	1.53(0.27 - 5.33)
-	Male	30(54.50%)	64(47.80%)	-	5(55.60%)	23(65.70%)	-
Smoke	No	54(98.20%)	129(96.30%)	2.09(0.16 - 12.08)	8(88.90%)	34(97.10%)	0.24(0.03 - 9.47)
-	Yes	1(1.80%)	5(3.70%)	-	1(11.10%)	1(2.90%)	-
Cough	No	55(100.00%)	75(56.00%)	86.53(0.42 - 114.71)	9(100.00%)	24(68.60%)	8.25(0.13 - 47.1)
-	Yes	0(0.00%)	59(44.00%)	-	0(0.00%)	11(31.40%)	-
Chest distress	No	55(100.00%)	132(98.50%)	1.67(0.06 - 28.13)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	2(1.50%)	-	0(0.00%)	0(0.00%)	-
Pharyngodynia	No	55(100.00%)	126(94.00%)	6.98(0.13 - 41.21)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	8(6.00%)	-	0(0.00%)	1(2.90%)	-
Anorexia	No	42(76.40%)	94(70.10%)	1.37(0.56 - 2.37)	5(55.60%)	24(68.60%)	0.57(0.18 - 3.5)
-	Yes	13(23.60%)	40(29.90%)	-	4(44.40%)	11(31.40%)	-
Diarrhea	No	51(92.70%)	120(89.60%)	1.49(0.37 - 3.78)	8(88.90%)	34(97.10%)	0.24(0.03 - 9.47)
-	Yes	4(7.30%)	14(10.40%)	-	1(11.10%)	1(2.90%)	-
Loss of smell and taste	No	55(100.00%)	131(97.80%)	2.52(0.07 - 30.32)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	3(2.20%)	-	0(0.00%)	0(0.00%)	-
Abdominal pain	No	53(96.40%)	129(96.30%)	1.03(0.19 - 5.38)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	2(3.60%)	5(3.70%)	-	0(0.00%)	1(2.90%)	-
Dry mouth	No	55(100.00%)	134(100.00%)	0.41(0.01 - 34.67)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(2.90%)	-
Heartburn	No	55(100.00%)	134(100.00%)	0.41(0.01 - 34.67)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(2.90%)	-
Gastrointestinal_Symptoms	No	31(56.40%)	64(47.80%)	1.41(0.62 - 2.19)	4(44.40%)	20(57.10%)	0.6(0.18 - 3.5)

(Table 2) contd....

		Death					
		No			Yes		
		Respiratory symptoms			Respiratory symptoms		
		No	Yes	OR (95% CI)	No	Yes	OR (95% CI)
		Count	Column N %	-	Count	Column N %	-
-	Yes	24(43.60%)	70(52.20%)	-	5(55.60%)	15(42.90%)	-
Myalgia	No	44(80.00%)	97(72.40%)	1.53(0.56 - 2.57)	6(66.70%)	26(74.30%)	0.69(0.18 - 4.14)
-	Yes	11(20.00%)	37(27.60%)	-	3(33.30%)	9(25.70%)	-
Fever	No	31(56.40%)	69(51.50%)	1.22(0.58 - 2.05)	7(77.80%)	21(60.00%)	2.33(0.26 - 7.99)
-	Yes	24(43.60%)	65(48.50%)	-	2(22.20%)	14(40.00%)	-
Chills	No	38(69.10%)	86(64.20%)	1.25(0.56 - 2.16)	8(88.90%)	26(74.30%)	2.77(0.17 - 14.23)
-	Yes	17(30.90%)	48(35.80%)	-	1(11.10%)	9(25.70%)	-
Weakness	No	33(60.00%)	83(61.90%)	0.92(0.51 - 1.83)	4(44.40%)	22(62.90%)	0.47(0.16 - 3.18)
-	Yes	22(40.00%)	51(38.10%)	-	5(55.60%)	13(37.10%)	-
Lethargy	No	31(56.40%)	80(59.70%)	0.87(0.5 - 1.78)	3(33.30%)	20(57.10%)	0.38(0.14 - 3.04)
-	Yes	24(43.60%)	54(40.30%)	-	6(66.70%)	15(42.90%)	-
Headache	No	49(89.10%)	102(76.10%)	2.56(0.59 - 3.84)	8(88.90%)	32(91.40%)	0.75(0.08 - 9.65)
-	Yes	6(10.90%)	32(23.90%)	-	1(11.10%)	3(8.60%)	-
Dizziness	No	52(94.50%)	115(85.80%)	2.86(0.45 - 5.57)	7(77.80%)	31(88.60%)	0.45(0.11 - 4.66)
-	Yes	3(5.50%)	19(14.20%)	-	2(22.20%)	4(11.40%)	-
Sweating	No	55(100.00%)	131(97.80%)	2.52(0.07 - 30.32)	8(88.90%)	34(97.10%)	0.24(0.03 - 9.47)
-	Yes	0(0.00%)	3(2.20%)	-	1(11.10%)	1(2.90%)	-
Restlessness	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Heartbeat	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Loss of conscious	No	51(92.70%)	133(99.30%)	0.1(0.04 - 3.31)	7(77.80%)	33(94.30%)	0.21(0.06 - 4.26)
-	Yes	4(7.30%)	1(0.70%)	-	2(22.20%)	2(5.70%)	-
Tachycardia	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Pregnancy	No	55(100.00%)	132(98.50%)	1.67(0.06 - 28.13)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	2(1.50%)	-	0(0.00%)	0(0.00%)	-
Seizure	No	54(98.20%)	133(99.30%)	0.41(0.04 - 11.01)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	1(1.80%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-

(Table 2) contd....

		Death					
		No			Yes		
		Respiratory symptoms			Respiratory symptoms		
		No	Yes	OR (95% CI)	No	Yes	OR (95% CI)
		Count	Column N %	-	Count	Column N %	-
Flushing	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Cyanosis	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Drowsiness	No	55(100.00%)	134(100.00%)	0.41(0.01 - 34.67)	8(88.90%)	35(100.00%)	0.11(0.01 - 12.66)
-	Yes	0(0.00%)	0(0.00%)	-	1(11.10%)	0(0.00%)	-
HTN	No	37(67.30%)	74(55.20%)	1.67(0.65 - 2.41)	4(44.40%)	21(60.00%)	0.53(0.17 - 3.34)
-	Yes	18(32.70%)	60(44.80%)	-	5(55.60%)	14(40.00%)	-
DM	No	38(69.10%)	77(57.50%)	1.65(0.64 - 2.42)	4(44.40%)	22(62.90%)	0.47(0.16 - 3.18)
-	Yes	17(30.90%)	57(42.50%)	-	5(55.60%)	13(37.10%)	-
PCI	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
ATN	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
PTE	No	54(98.20%)	134(100.00%)	0.2(0.02 - 15.09)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	1(1.80%)	0(0.00%)	-	0(0.00%)	0(0.00%)	-
uc	No	54(98.20%)	134(100.00%)	0.2(0.02 - 15.09)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	1(1.80%)	0(0.00%)	-	0(0.00%)	0(0.00%)	-
copd	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
DKA	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Angiography	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
PCR	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	1(2.90%)	-

(Table 2) contd....

		Death					
		No			Yes		
		Respiratory symptoms			Respiratory symptoms		
		No	Yes	OR (95% CI)	No	Yes	OR (95% CI)
		Count	Column N %	-	Count	Column N %	-
IHD	No	44(80.00%)	109(81.30%)	0.92(0.44 - 2.12)	7(77.80%)	28(80.00%)	0.88(0.16 - 5.58)
-	Yes	11(20.00%)	25(18.70%)	-	2(22.20%)	7(20.00%)	-
CVA	No	52(94.50%)	128(95.50%)	0.81(0.22 - 3.79)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	3(5.50%)	6(4.50%)	-	0(0.00%)	0(0.00%)	-
TB	No	55(100.00%)	134(100.00%)	0.41(0.01 - 34.67)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(2.90%)	-
Hypothyroid	No	54(98.20%)	128(95.50%)	2.53(0.18 - 12.73)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	1(1.80%)	6(4.50%)	-	0(0.00%)	1(2.90%)	-
Hyperthyroid	No	55(100.00%)	134(100.00%)	0.41(0.01 - 34.67)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(2.90%)	-
Anemia	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	8(88.90%)	34(97.10%)	0.24(0.03 - 9.47)
-	Yes	0(0.00%)	1(0.70%)	-	1(11.10%)	1(2.90%)	-
Breast cancer	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
KTP	No	51(92.70%)	129(96.30%)	0.49(0.19 - 2.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	4(7.30%)	5(3.70%)	-	0(0.00%)	0(0.00%)	-
Autoimmune disease	No	54(98.20%)	130(97.00%)	1.66(0.14 - 11.41)	8(88.90%)	33(94.30%)	0.48(0.06 - 9.09)
-	Yes	1(1.80%)	4(3.00%)	-	1(11.10%)	2(5.70%)	-
Malignancy/tumor	No	51(92.70%)	130(97.00%)	0.39(0.16 - 2.76)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	4(7.30%)	4(3.00%)	-	0(0.00%)	0(0.00%)	-
Heart failure	No	54(98.20%)	130(97.00%)	1.66(0.14 - 11.41)	8(88.90%)	34(97.10%)	0.24(0.03 - 9.47)
-	Yes	1(1.80%)	4(3.00%)	-	1(11.10%)	1(2.90%)	-
Seizure_A	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Allergy	No	54(98.20%)	132(98.50%)	0.82(0.08 - 10.32)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	1(1.80%)	2(1.50%)	-	0(0.00%)	0(0.00%)	-
Renal stone	No	55(100.00%)	130(97.00%)	3.38(0.09 - 32.67)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)

(Table 2) contd....

		Death					
		No			Yes		
		Respiratory symptoms			Respiratory symptoms		
		No	Yes	OR (95% CI)	No	Yes	OR (95% CI)
		Count	Column N %	-	Count	Column N %	-
-	Yes	0(0.00%)	4(3.00%)	-	0(0.00%)	1(2.90%)	-
ESRD	No	50(90.90%)	129(96.30%)	0.39(0.18 - 2.39)	9(100.00%)	32(91.40%)	1.69(0.06 - 27.42)
-	Yes	5(9.10%)	5(3.70%)	-	0(0.00%)	3(8.60%)	-
Asthma	No	53(96.40%)	130(97.00%)	0.82(0.16 - 5.15)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	2(3.60%)	4(3.00%)	-	0(0.00%)	0(0.00%)	-
Airway disease	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Surgery	No	54(98.20%)	134(100.00%)	0.2(0.02 - 15.09)	8(88.90%)	34(97.10%)	0.24(0.03 - 9.47)
-	Yes	1(1.80%)	0(0.00%)	-	1(11.10%)	1(2.90%)	-
HLP	No	49(89.10%)	121(90.30%)	0.88(0.34 - 2.63)	7(77.80%)	34(97.10%)	0.1(0.03 - 4.7)
-	Yes	6(10.90%)	13(9.70%)	-	2(22.20%)	1(2.90%)	-
CABG	No	51(92.70%)	123(91.80%)	1.14(0.32 - 3.48)	8(88.90%)	33(94.30%)	0.48(0.06 - 9.09)
-	Yes	4(7.30%)	11(8.20%)	-	1(11.10%)	2(5.70%)	-
CKD	No	53(96.40%)	131(97.80%)	0.61(0.13 - 4.96)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	2(3.60%)	3(2.20%)	-	0(0.00%)	0(0.00%)	-
Parkinson's	No	55(100.00%)	134(100.00%)	0.41(0.01 - 34.67)	8(88.90%)	35(100.00%)	0.11(0.01 - 12.66)
-	Yes	0(0.00%)	0(0.00%)	-	1(11.10%)	0(0.00%)	-
Respiratory disease	No	55(100.00%)	132(98.50%)	1.67(0.06 - 28.13)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	2(1.50%)	-	0(0.00%)	1(2.90%)	-
Mental problems	No	55(100.00%)	134(100.00%)	0.41(0.01 - 34.67)	8(88.90%)	34(97.10%)	0.24(0.03 - 9.47)
-	Yes	0(0.00%)	0(0.00%)	-	1(11.10%)	1(2.90%)	-
IBD	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
Liver transplant	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	0(0.00%)	-
CT	No	6(10.90%)	25(18.70%)	0.53(0.29 - 1.97)	1(11.10%)	3(8.60%)	1.33(0.1 - 12.39)
-	Yes	49(89.10%)	109(81.30%)	-	8(88.90%)	32(91.40%)	-
A.V	No	26(47.30%)	43(32.10%)	1.9(0.7 - 2.51)	2(22.20%)	11(31.40%)	0.62(0.14 - 4.58)

(Table 2) contd....

		Death					
		No			Yes		
		Respiratory Symptoms			Respiratory Symptoms		
		No	Yes	OR (95% CI)	No	Yes	OR (95% CI)
		Count	Column N %	-	Count	Column N %	-
-	Yes	29(52.70%)	91(67.90%)	-	7(77.80%)	24(68.60%)	-
AB	No	35(63.60%)	67(50.00%)	1.75(0.67 - 2.43)	5(55.60%)	18(51.40%)	1.18(0.25 - 4.69)
-	Yes	20(36.40%)	67(50.00%)	-	4(44.40%)	17(48.60%)	-
AF	No	55(100.00%)	133(99.30%)	0.83(0.03 - 27.85)	9(100.00%)	34(97.10%)	0.53(0.02 - 24.46)
-	Yes	0(0.00%)	1(0.70%)	-	0(0.00%)	1(2.90%)	-
Corticosteroid	No	55(100.00%)	132(98.50%)	1.67(0.06 - 28.13)	9(100.00%)	35(100.00%)	0.26(0.01 - 29.91)
-	Yes	0(0.00%)	2(1.50%)	-	0(0.00%)	0(0.00%)	-
Ad_death_time		7.31(4.1)	8.79(4.45)	0.041	8.29(4.42)	9.47(4.59)	0.538
ICU_Adtime		6.8(4.44)	7.63(3.22)	0.177	11(2.89)	7.63(3.83)	0.487
age		59.49(17.45)	56.52(16.28)	0.266	64.78(12.43)	65.63(14.08)	0.870
Respiratory rate		23.02(4.66)	27.46(8.57)	0.000	27(7.26)	30.69(11.76)	0.377
O2 index		93.25(13.59)	88.36(20.03)	0.108	79(32.04)	83.97(17.72)	0.546
AST		44.02(43.98)	43.82(29.66)	0.972	49.89(21.75)	68.12(85.44)	0.533
ALT		38.12(107.86)	30.21(28.07)	0.450	24.78(24.26)	39(77.4)	0.592
ASTALT ratio		1.95(0.9)	1.75(0.7)	0.115	2.98(1.9)	2.22(1.1)	0.125
Total bilirubin		1.22(0.8)	1.14(0.83)	0.585	1.11(0.65)	1.32(0.57)	0.361
Direct bilirubin		0.31(0.27)	0.29(0.26)	0.640	0.76(1.24)	0.4(0.35)	0.145
ALKP		203.7(69.8)	204.09(91.96)	0.979	186.71(57.53)	233.16(150.3)	0.430
Creatinine		3.61(9.81)	1.83(2.49)	0.060	2.1(2.26)	3.75(9.45)	0.608
BUN		34.32(30.63)	24.77(21.08)	0.019	48.22(48.56)	40.78(36.7)	0.616
LDH		532.37(270.15)	561.11(208.83)	0.468	621.56(277.75)	731.75(272.82)	0.293
CK.MB		41.3(99.71)	31.02(40.74)	0.362	99.29(105.57)	39.26(34.04)	0.011
WBC		10.17(22.71)	8.51(4.41)	0.425	8.19(4.14)	8.99(5.85)	0.703
Neutrophil		66.4(23.58)	60.47(27.47)	0.183	64.8(28.88)	74.61(17.02)	0.209
Lymphocyte		22.03(13.77)	20(13.96)	0.386	18.49(15.58)	17.6(9.49)	0.834
RBC		4.4(2.57)	4.34(0.76)	0.831	4.3(0.78)	4.14(0.95)	0.647
Hb		11.96(3.15)	12.76(7.92)	0.495	12.58(3.19)	12.42(3.27)	0.897
HCT		33.42(7.31)	34.99(6.46)	0.163	36.13(7.85)	35.59(9.92)	0.882
PLT		179.14(65.82)	215.64(100.11)	0.019	227.33(135.12)	185.21(94.36)	0.287
PT		13.45(3.63)	13.1(3.07)	0.528	13.13(2.03)	15(6.85)	0.453
PTT		37.7(18.52)	38.22(18.2)	0.869	37.38(8.18)	38.86(19.29)	0.835
INR		1.27(0.76)	1.2(0.65)	0.572	1.15(0.28)	2.54(5.16)	0.456

(Table 2) contd....

	Death					
	No			Yes		
	Respiratory Symptoms			Respiratory Symptoms		
	No	Yes	OR (95% CI)	No	Yes	OR (95% CI)
	Count	Column N %	-	Count	Column N %	-
ESR	52.35(31.17)	59.07(29.33)	0.207	46(28.3)	56.53(32.98)	0.419
crp	43.39(28.29)	45.64(29.16)	0.676	58.09(33.95)	61.91(25.06)	0.736
BS	151.59(78.27)	184.94(117.58)	0.070	143.78(105.56)	204.27(115.28)	0.164
Na	136.24(4.74)	146.86(110.77)	0.500	136(4.42)	136.18(7.92)	0.949
K	4.49(0.75)	4.54(0.69)	0.672	4.48(0.6)	4.5(0.62)	0.928
Ca	8.2(0.9)	8.29(0.99)	0.591	8.5(0.63)	8.38(0.86)	0.702
P	3.71(0.98)	3.77(2.64)	0.888	6.31(3.66)	3.56(1.23)	0.001

Table 3. The distribution of presence/absence of gastrointestinal symptoms in two levels of death/discharged patients.

		Death					
		No			Yes		
		Gastrointestinal Symptoms			Gastrointestinal Symptoms		
		No	Yes	-	No	Yes	--
		Count	Column N %	OR (95% CI)	Count	Column N %	OR (95% CI)
ICU_Ad_status	0	80(84.20%)	87(92.60%)	0.43(0.27 - 1.79)	14(58.30%)	13(65.00%)	0.75(0.26 - 3.01)
-	1	15(15.80%)	7(7.40%)	-	10(41.70%)	7(35.00%)	-
Gender	Female	48(50.50%)	47(50.00%)	1.02(0.57 - 1.79)	8(33.30%)	8(40.00%)	0.75(0.26 - 3.03)
-	Male	47(49.50%)	47(50.00%)	-	16(66.70%)	12(60.00%)	-
Smoke	No	93(97.90%)	90(95.70%)	2.07(0.24 - 7.67)	23(95.80%)	19(95.00%)	1.21(0.06 - 18.55)
-	Yes	2(2.10%)	4(4.30%)	-	1(4.20%)	1(5.00%)	-
Chest distress	No	94(98.90%)	93(98.90%)	1.01(0.06 - 16.3)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	1(1.10%)	-	0(0.00%)	0(0.00%)	-
Pharyngodynia	No	93(97.90%)	88(93.60%)	3.17(0.32 - 8.4)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	2(2.10%)	6(6.40%)	-	0(0.00%)	1(5.00%)	-
Nausea	No	95(100.00%)	55(58.50%)	134.73(0.51 - 139.59)	24(100.00%)	17(85.00%)	8.47(0.12 - 53.82)
-	Yes	0(0.00%)	39(41.50%)	-	0(0.00%)	3(15.00%)	-
Vomiting	No	95(100.00%)	62(66.00%)	98.06(0.44 - 121.9)	24(100.00%)	15(75.00%)	16(0.17 - 65.5)
-	Yes	0(0.00%)	32(34.00%)	-	0(0.00%)	5(25.00%)	-
Diarrhea	No	95(100.00%)	76(80.90%)	45(0.31 - 88.19)	24(100.00%)	18(90.00%)	5.33(0.09 - 48.7)
-	Yes	0(0.00%)	18(19.10%)	-	0(0.00%)	2(10.00%)	-
Loss of smell and taste	No	95(100.00%)	91(96.80%)	6.26(0.11 - 44.91)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)

(Table 3) contd....

		Death					
		No			Yes		
		Gastrointestinal Symptoms			Gastrointestinal Symptoms		
		No	Yes	-	No	Yes	-
		Count	Column N %	OR (95% CI)	Count	Column N %	OR (95% CI)
-	Yes	0(0.00%)	3(3.20%)	-	0(0.00%)	0(0.00%)	-
Abdominal pain	No	95(100.00%)	87(92.60%)	15.29(0.18 - 58.45)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	0(0.00%)	7(7.40%)	-	0(0.00%)	1(5.00%)	-
Dry mouth	No	95(100.00%)	94(100.00%)	1.01(0.02 - 51.16)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(5.00%)	-
Heartburn	No	95(100.00%)	94(100.00%)	1.01(0.02 - 51.16)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(5.00%)	-
Myalgia	No	76(80.00%)	65(69.10%)	1.78(0.66 - 2.5)	20(83.30%)	12(60.00%)	3.33(0.42 - 6.82)
-	Yes	19(20.00%)	29(30.90%)	-	4(16.70%)	8(40.00%)	-
Fever	No	51(53.70%)	49(52.10%)	1.06(0.58 - 1.82)	15(62.50%)	13(65.00%)	0.9(0.28 - 3.28)
-	Yes	44(46.30%)	45(47.90%)	-	9(37.50%)	7(35.00%)	-
Chills	No	62(65.30%)	62(66.00%)	0.97(0.54 - 1.8)	19(79.20%)	15(75.00%)	1.27(0.27 - 4.55)
-	Yes	33(34.70%)	32(34.00%)	-	5(20.80%)	5(25.00%)	-
Weakness	No	63(66.30%)	53(56.40%)	1.52(0.67 - 2.16)	18(75.00%)	8(40.00%)	4.5(0.53 - 6.95)
-	Yes	32(33.70%)	41(43.60%)	-	6(25.00%)	12(60.00%)	-
Lethargy	No	60(63.20%)	51(54.30%)	1.45(0.66 - 2.1)	17(70.80%)	6(30.00%)	5.67(0.58 - 7.79)
-	Yes	35(36.80%)	43(45.70%)	-	7(29.20%)	14(70.00%)	-
Headache	No	81(85.30%)	70(74.50%)	1.98(0.65 - 2.8)	22(91.70%)	18(90.00%)	1.22(0.14 - 8.53)
-	Yes	14(14.70%)	24(25.50%)	-	2(8.30%)	2(10.00%)	-
Dizziness	No	90(94.70%)	77(81.90%)	3.97(0.64 - 5.16)	21(87.50%)	17(85.00%)	1.24(0.2 - 6.14)
-	Yes	5(5.30%)	17(18.10%)	-	3(12.50%)	3(15.00%)	-
Sweating	No	95(100.00%)	91(96.80%)	6.26(0.11 - 44.91)	23(95.80%)	19(95.00%)	1.21(0.06 - 18.55)
-	Yes	0(0.00%)	3(3.20%)	-	1(4.20%)	1(5.00%)	-
Restlessness	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	0(0.00%)	1(1.10%)	-	0(0.00%)	0(0.00%)	-
Heartbeat	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	-
Loss of consciousness	No	92(96.80%)	92(97.90%)	0.67(0.14 - 5.14)	20(83.30%)	20(100.00%)	0.13(0.02 - 8.18)
-	Yes	3(3.20%)	2(2.10%)	-	4(16.70%)	0(0.00%)	-

(Table 3) contd....

		Death					
		No			Yes		
		Gastrointestinal Symptoms			Gastrointestinal Symptoms		
		No	Yes	-	No	Yes	-
		Count	Column N %	OR (95% CI)	Count	Column N %	OR (95% CI)
Tachycardia	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	
Pregnancy	No	94(98.90%)	93(98.90%)	1.01(0.06 - 16.3)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	1(1.10%)	-	0(0.00%)	0(0.00%)	
Seizure	No	94(98.90%)	93(98.90%)	1.01(0.06 - 16.3)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	1(1.10%)	-	0(0.00%)	0(0.00%)	
Flushing	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	
Cyanosis	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	0(0.00%)	1(1.10%)	-	0(0.00%)	0(0.00%)	
Drowsiness	No	95(100.00%)	94(100.00%)	1.01(0.02 - 51.16)	23(95.80%)	20(100.00%)	0.58(0.03 - 24.7)
-	Yes	0(0.00%)	0(0.00%)	-	1(4.20%)	0(0.00%)	
HTN	No	58(61.10%)	53(56.40%)	1.21(0.61 - 1.94)	14(58.30%)	11(55.00%)	1.15(0.32 - 3.51)
-	Yes	37(38.90%)	41(43.60%)		10(41.70%)	9(45.00%)	
DM	No	66(69.50%)	49(52.10%)	2.09(0.76 - 2.5)	17(70.80%)	9(45.00%)	2.97(0.46 - 5.57)
-	Yes	29(30.50%)	45(47.90%)	-	7(29.20%)	11(55.00%)	
PCI	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	0(0.00%)	1(1.10%)	-	0(0.00%)	0(0.00%)	
ATN	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	
PTE	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
	Yes	1(1.10%)	0(0.00)	-	0(0.00%)	0(0.00%)	
uc	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
	Yes	0(0.00%)	1(1.10%)	-	0(0.00%)	0(0.00%)	
copd	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	
DKA	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	
Angiography	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
	Yes	0(0.00%)	1(1.10%)	-	0(0.00%)	0(0.00%)	
PCR	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	23(95.80%)	20(100.00%)	0.58(0.03 - 24.7)
	Yes	1(1.10%)	0(0.00%)	-	1(4.20%)	0(0.00%)	

(Table 3) contd....

		Death					
		No			Yes		
		Gastrointestinal Symptoms			Gastrointestinal Symptoms		
		No	Yes	-	No	Yes	-
		Count	Column N %	OR (95% CI)	Count	Column N %	OR (95% CI)
IHD	No	76(80.00%)	77(81.90%)	0.88(0.46 - 1.96)	20(83.30%)	15(75.00%)	1.67(0.29 - 5.46)
-	Yes	19(20.00%)	17(18.10%)	-	4(16.70%)	5(25.00%)	-
CVA	No	89(93.70%)	91(96.80%)	0.49(0.18 - 3.02)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	6(6.30%)	3(3.20%)	-	0(0.00%)	0(0.00%)	-
TB	No	95(100.00%)	94(100.00%)	1.01(0.02 - 51.16)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(5.00%)	-
Hypothyroid	No	91(95.80%)	91(96.80%)	0.75(0.19 - 4.06)	23(95.80%)	20(100.00%)	0.58(0.03 - 24.7)
-	Yes	4(4.20%)	3(3.20%)	-	1(4.20%)	0(0.00%)	-
Hyperthyroid	No	95(100.00%)	94(100.00%)	1.01(0.02 - 51.16)	23(95.80%)	20(100.00%)	0.58(0.03 - 24.7)
-	Yes	0(0.00%)	0(0.00%)	-	1(4.20%)	0(0.00%)	-
Anemia	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	22(91.70%)	20(100.00%)	0.28(0.02 - 13.42)
-	Yes	0(0.00%)	1(1.10%)	-	2(8.30%)	0(0.00%)	-
Breast cancer	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	-
KTP	No	91(95.80%)	89(94.70%)	1.28(0.29 - 4.28)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	4(4.20%)	5(5.30%)	-	0(0.00%)	0(0.00%)	-
Autoimmune disease	No	91(95.80%)	93(98.90%)	0.24(0.06 - 4.95)	22(91.70%)	19(95.00%)	0.58(0.07 - 9.4)
-	Yes	4(4.20%)	1(1.10%)	-	2(8.30%)	1(5.00%)	-
Malignancy/tumor	No	89(93.70%)	92(97.90%)	0.32(0.12 - 3.11)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	6(6.30%)	2(2.10%)	-	0(0.00%)	0(0.00%)	-
Heart failure	No	91(95.80%)	93(98.90%)	0.24(0.06 - 4.95)	22(91.70%)	20(100.00%)	0.28(0.02 - 13.42)
-	Yes	4(4.20%)	1(1.10%)	-	2(8.30%)	0(0.00%)	-
Seizure_A	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	-
Allergy	No	93(97.90%)	93(98.90%)	0.5(0.07 - 8.3)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	2(2.10%)	1(1.10%)	-	0(0.00%)	0(0.00%)	-
Renal stone	No	93(97.90%)	92(97.90%)	1.01(0.14 - 7.28)	23(95.80%)	20(100.00%)	0.58(0.03 - 24.7)
-	Yes	2(2.10%)	2(2.10%)	-	1(4.20%)	0(0.00%)	-
ESRD	No	89(93.70%)	90(95.70%)	0.66(0.23 - 3.06)	22(91.70%)	19(95.00%)	0.58(0.07 - 9.4)
-	Yes	6(6.30%)	4(4.30%)	-	2(8.30%)	1(5.00%)	-

(Table 3) contd....

		Death					
		No			Yes		
		Gastrointestinal Symptoms			Gastrointestinal Symptoms		
		No	Yes	-	No	Yes	-
		Count	Column N %	OR (95% CI)	Count	Column N %	OR (95% CI)
Asthma	No	92(96.80%)	91(96.80%)	1.01(0.2 - 5.11)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	3(3.20%)	3(3.20%)	-	0(0.00%)	0(0.00%)	-
Airway disease	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	-
Surgery	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	22(91.70%)	20(100.00%)	0.28(0.02 - 13.42)
-	Yes	1(1.10%)	0(0.00%)	-	2(8.30%)	0(0.00%)	-
HLP	No	88(92.60%)	82(87.20%)	1.84(0.49 - 3.47)	23(95.80%)	18(90.00%)	2.56(0.13 - 17.92)
-	Yes	7(7.40%)	12(12.80%)	-	1(4.20%)	2(10.00%)	-
CABG	No	91(95.80%)	83(88.30%)	3.02(0.5 - 5.27)	22(91.70%)	19(95.00%)	0.58(0.07 - 9.4)
-	Yes	4(4.20%)	11(11.70%)	-	2(8.30%)	1(5.00%)	-
CKD	No	94(98.90%)	90(95.70%)	4.18(0.2 - 16.97)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	4(4.30%)	-	0(0.00%)	0(0.00%)	-
Parkinson's	No	95(100.00%)	94(100.00%)	1.01(0.02 - 51.16)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	0(0.00%)	0(0.00%)	-	0(0.00%)	1(5.00%)	-
Respiratory disease	No	93(97.90%)	94(100.00%)	0.25(0.02 - 12.25)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	2(2.10%)	0(0.00%)	-	0(0.00%)	1(5.00%)	-
Mental problems	No	95(100.00%)	94(100.00%)	1.01(0.02 - 51.16)	23(95.80%)	19(95.00%)	1.21(0.06 - 18.55)
-	Yes	0(0.00%)	0(0.00%)	-	1(4.20%)	1(5.00%)	-
IBD	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	0(0.00%)	1(1.10%)	-	0(0.00%)	0(0.00%)	-
Liver transplant	No	94(98.90%)	94(100.00%)	0.5(0.02 - 22.33)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)
-	Yes	1(1.10%)	0(0.00%)	-	0(0.00%)	0(0.00%)	-
CT	No	17(17.90%)	14(14.90%)	1.25(0.51 - 2.38)	1(4.20%)	3(15.00%)	0.25(0.05 - 5.7)
-	Yes	78(82.10%)	80(85.10%)	-	23(95.80%)	17(85.00%)	-
A.V	No	37(38.90%)	32(34.00%)	1.24(0.61 - 1.98)	7(29.20%)	6(30.00%)	0.96(0.27 - 3.61)
-	Yes	58(61.10%)	62(66.00%)	-	17(70.80%)	14(70.00%)	-
AB	No	55(57.90%)	47(50.00%)	1.38(0.65 - 2.04)	12(50.00%)	11(55.00%)	0.82(0.28 - 3.01)
-	Yes	40(42.10%)	47(50.00%)	-	12(50.00%)	9(45.00%)	-
AF	No	95(100.00%)	93(98.90%)	2.04(0.05 - 41.15)	24(100.00%)	19(95.00%)	2.53(0.05 - 47)
-	Yes	0(0.00%)	1(1.10%)	-	0(0.00%)	1(5.00%)	-
Corticosteroid	No	94(98.90%)	93(98.90%)	1.01(0.06 - 16.3)	24(100.00%)	20(100.00%)	1.2(0.02 - 57.05)

(Table 3) contd....

		Death					
		No			Yes		
		Gastrointestinal Symptoms			Gastrointestinal Symptoms		
		No	Yes	-	No	Yes	-
		Count	Column N %	OR (95% CI)	Count	Column N %	OR (95% CI)
-	Yes	1(1.10%)	1(1.10%)		0(0.00%)	0(0.00%)	
Ad_death_time	-	8.31(4.95)	8.4(3.78)	0.891	9.86(4.9)	8.47(4)	0.348
ICU_Avertime	-	7.25(3.28)	7.88(3.87)	0.737	8.6(3.95)	6.71(3.55)	0.207
Age	-	58.69(17.97)	56.06(15.15)	0.278	63.96(14.58)	67.25(12.5)	0.431
AST	-	44.5(39.01)	43.24(29.01)	0.810	61.57(52.88)	67.42(99.41)	0.808
ALT	-	36.64(84.74)	28.33(24.82)	0.384	27(21.05)	46.79(101.1)	0.365
ASTALT ratio	-	1.83(0.8)	1.79(0.74)	0.749	2.55(1.43)	2.18(1.18)	0.369
Total bilirubin	-	1.21(0.73)	1.12(0.91)	0.468	1.25(0.61)	1.3(0.57)	0.778
Direct bilirubin	-	0.31(0.21)	0.29(0.3)	0.580	0.53(0.81)	0.41(0.38)	0.555
ALKP	-	208.03(86.42)	199.92(85.71)	0.537	227.9(159.76)	221.22(114.19)	0.883
Creatinine	-	2.72(7.59)	1.94(2.45)	0.359	4.31(11.24)	2.37(3.15)	0.458
BUN	-	26.88(22.39)	28.1(26.55)	0.741	39.28(37.11)	45.85(41.64)	0.587
LDH	-	527.01(218.33)	577.85(233.93)	0.153	736.18(279.46)	674.42(271.93)	0.479
CK.MB	-	36.49(56.92)	31.75(70.37)	0.646	51.52(47.08)	48.82(69.73)	0.888
WBC	-	9.35(17.35)	8.61(4.62)	0.692	7.72(4.87)	10.02(5.99)	0.179
Neutrophil	-	62.44(26.24)	61.97(26.82)	0.907	69.72(20.71)	75.42(20.06)	0.390
Lymphocyte	-	18.98(11.81)	22.09(15.5)	0.143	20.23(12.83)	14.99(7.68)	0.138
RBC	-	4.2(0.84)	4.51(1.92)	0.174	3.82(0.86)	4.6(0.78)	0.006
Hb	-	11.99(2.54)	13.08(9.39)	0.295	11.78(3.62)	13.19(2.58)	0.158
HCT	-	33.95(5.91)	35.11(7.4)	0.251	33.97(10.92)	37.85(6.83)	0.198
PLT	-	194.81(77.78)	215.67(105.11)	0.137	196.95(138.08)	191.25(47.46)	0.862
PT	-	13.41(3.73)	12.99(2.68)	0.390	13.68(1.7)	15.88(9.33)	0.286
PTT	-	39.24(19.55)	37(16.97)	0.423	38.55(7.33)	38.5(25.17)	0.993
INR	-	1.27(0.79)	1.18(0.56)	0.423	1.25(0.25)	3.63(6.99)	0.117
ESR	-	52.99(28.1)	61.25(31.06)	0.078	59.95(34.1)	47.75(28.94)	0.258
crp	-	44.71(29.57)	45.35(28.27)	0.893	59.46(25.94)	63.01(27.63)	0.690
BS	-	152.88(89.13)	198.08(121.52)	0.007	145.05(79.04)	242.2(127.78)	0.005
Na	-	151.5(132.07)	136.1(5.16)	0.282	136.83(7.16)	135.35(7.51)	0.514
K	-	4.41(0.71)	4.64(0.68)	0.030	4.27(0.48)	4.76(0.65)	0.007
Ca	-	8.23(1.15)	8.3(0.74)	0.630	8.34(0.85)	8.46(0.79)	0.646
P	-	3.78(2.91)	3.73(1.47)	0.871	3.74(1.63)	4.43(2.59)	0.325

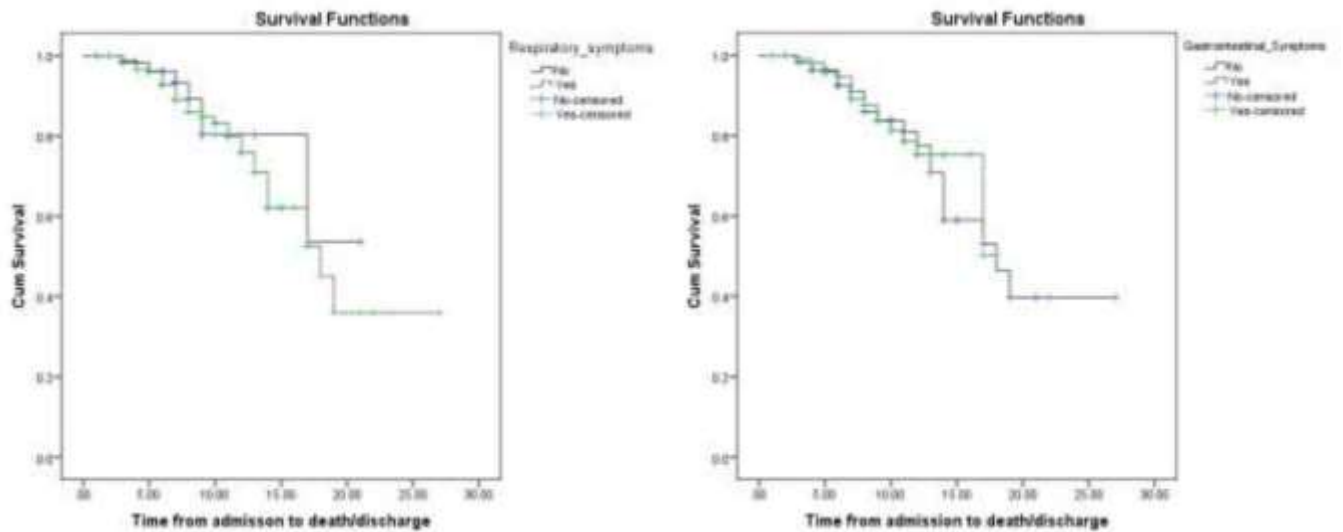


Fig. (1). Kaplan-Meier curve for survival probabilities of respiratory and gastrointestinal symptoms. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

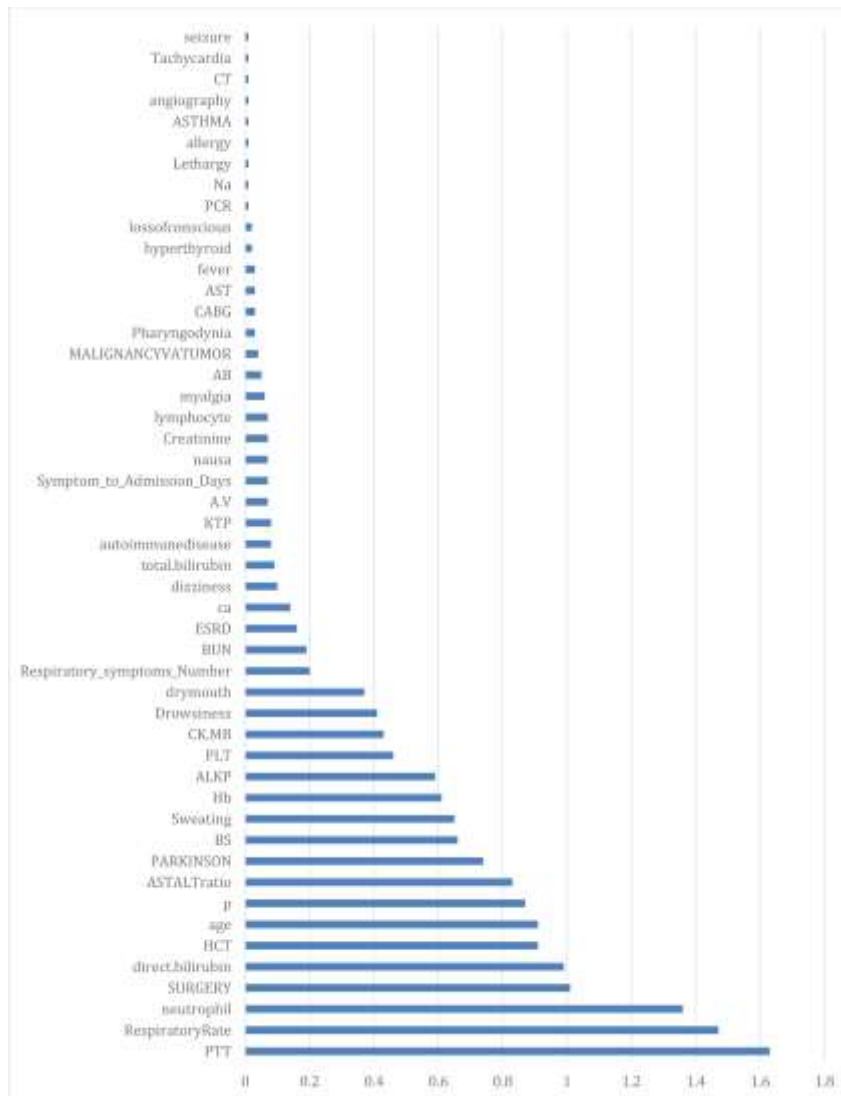


Fig. (2). The importance of factors affecting death/discharged patients due to COVID-19. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

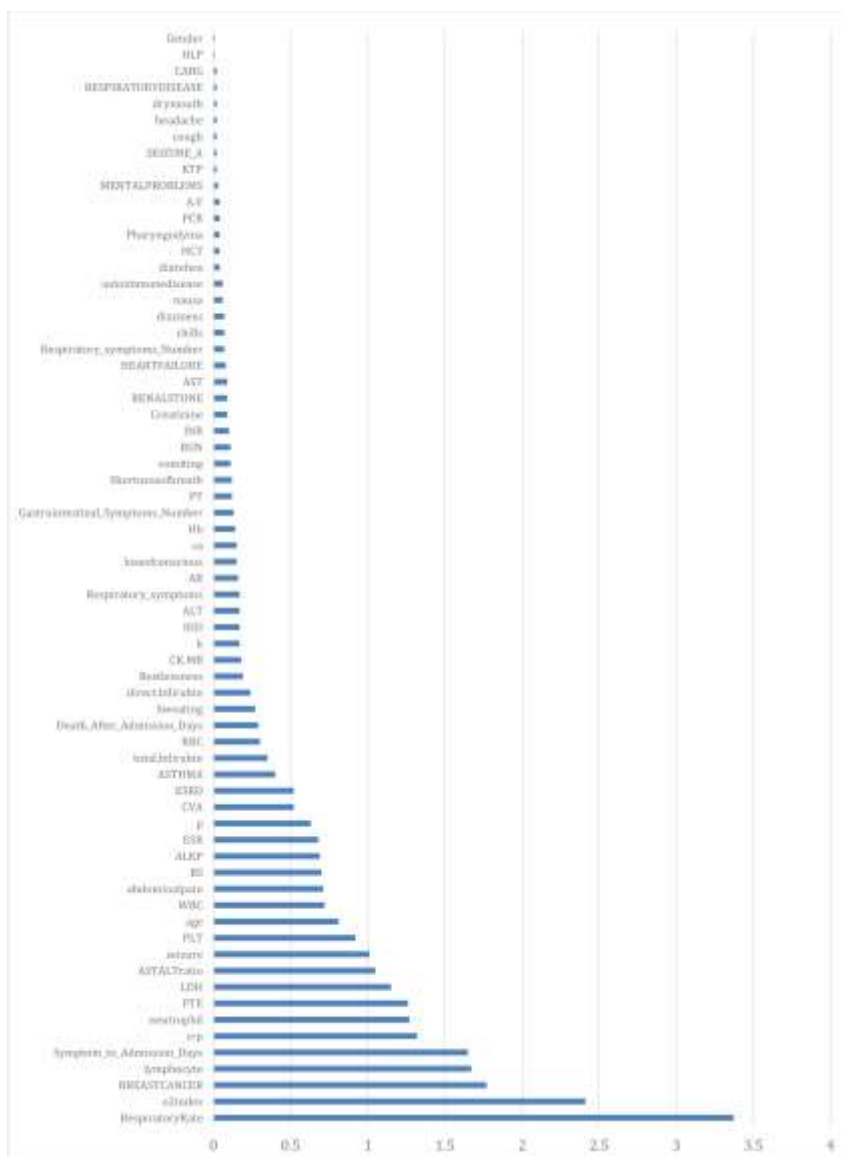


Fig. (3). The importance of variables affecting ICU admission followed by COVID-19. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

Furthermore, we compared the clinical characteristics of COVID-19 patients with and without gastrointestinal symptoms. The values of BS and potassium were significantly higher in all patients with GI symptoms [41-43], although diabetes mellitus is considered to be a risk factor for mortality in COVID-19 patients [44-46]. Moreover, there was no significant difference in the survival curve of patients with or without GI symptoms, and respiratory signs speculating neither GI nor respiratory manifestations did not affect the survival of COVID-19 patients. On the contrary, other studies with a higher sample size reported that respiratory symptoms are associated with survival rate in COVID-19 patients [29, 47, 48]. Moreover, the most important variables affecting mortality were O₂ index, anemia, white blood cells (WBC), LDH, INR, PT, erythrocyte sedimentation rate (ESR), PTT, respiratory rate, neutrophil, and direct bilirubin. This evidence depicted that respiratory hallmarks potentially influence survival rate, which was contrary to the results found in other

studies. Hence, further research works are necessary to justify this discrepancy.

Previously, two large clinical studies from China focused on GI symptoms [49-52]. In the study conducted by Jin *et al.*, a total of 74 patients infected with SARS-CoV-2 manifested GI symptoms, such as diarrhoea, nausea, and vomiting. Interestingly, up to 28% of those patients with GI symptoms did not manifest respiratory symptoms [49]. They demonstrated that these patients, compared to those without GI symptoms, had overall more severe/critical disease, and more individuals were reported to have fever >38.5 °C and family clustering and higher rates of liver injury following assessment by elevated AST levels [49].

CONCLUSION

Gastrointestinal symptoms are not found to be associated with the longevity rate of COVID-19 patients, suggesting that

they are probably not recognized as a suitable prognostic factor. However, our findings regarding the relationship between respiratory signs and survival rate were controversial may be due to the small size of under-studied patients. Interestingly, some serum criteria, including lower BUN and higher PLT, can be considered promising prognostic factors in COVID-19 and others, such as platelet count, may support the non-acute phase of the COVID-19 disease.

LIST OF ABBREVIATIONS

ACE2	=	Angiotensin-Converting Enzyme 2
COVID-19	=	Coronavirus Disease 2019
CRP	=	C-reactive Protein
ESR	=	Erythrocyte Sedimentation Rate
GI	=	Gastrointestinal
LDH	=	lactate Dehydrogenase
RT-Qpcr	=	Reverse Transcriptase Quantitative Polymerase Chain Reaction
WBC	=	White Blood Cells

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran (IR.AJUMS.REC.1399.276). The purpose of the study was described to all patients, and written consent was obtained from them.

HUMAN AND ANIMAL RIGHTS

No animals were used in the study. All human procedures were performed in accordance with the ethical principles for medical research involving human subjects by the World Medical Association Declaration of Helsinki.

STANDARDS OF REPORTING

STROBE guidelines were followed.

CONSENT FOR PUBLICATION

The authors declare to follow all the protocols concerning the publication of patient data and that all the patients included in the study have received sufficient information and have given their informed consent in writing to participate in the study.

AVAILABILITY OF DATA AND MATERIALS

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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