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Evaluation of factors which determining survival of SARS-COV-2 infected patients in intensive care unit

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ABSTRACT

Background: The disease SARS-COV-2, which started in Wuhan city of China and caused pandemic, created an increasing number of intensive care needs due to its severe respiratory failure. The factors that determine the course of patients followed in intensive care are different. Therefore, our aim was to determine the factors that predict mortality and affect prognosis by evaluating the patients admitted to our intensive care unit.

Material and Method: This study is a single-center retrospective study involving 156 patients admitted to our intensive care unit , who was diagnosed with SARS-COV-2 between 20 March and 8 June 2020. The data including characteristics, symptoms and laboratory findings of the patients were recorded and their relationships to mortality were evaluated

Results: The mean age was 69±15 years and 63% were male. The most common symptom was dyspnea (69.9%) and fever (60.9%), respectively. Comorbidity was present in 82% and the most common comorbidity was HT and DM, respectively. All patients were admitted to the intensive care unit with (due to) hypoxemic respiratory failure. 106 patients (68.8%) were connected to mechanical ventilation, which was associated with mortality ($p<0.0001$). High flow oxygen therapy was delivered in 31 patients and was associated with survival ($p<0.05$). Tocilizumab, given in addition to the treatments increased the survival ($p<0.05$).

Conclusion: We saw in our study that many parameters will be effective in predicting survival. As the most determining factors, not being intubated during admission and/or follow-up was observed to be effective on survival and was found to be associated with mortality.

Keywords: SARS-COV-2, intensive care unit, mortality, intubation

INTRODUCTION

A world-wide epidemic is called a pandemic. The Spanish flu, which infects a large part of the world's population in 1918 and killed about 50 million people, is the most well known (1). Covid-19 infection, which started endemically in December 2019 and caused an epidemic in China, was declared as a pandemic by WHO since it was seen in many countries worldwide (2). On February 11, 2020, 2019-nCoV, which emerged in 2019, was officially named SARS-COV-2 based on phylogeny, taxonomy and established practice, and the disease caused by SARS-COV-2 was also called Covid-19 (3,4). SARS-COV-2 infection, which causes pandemic worldwide, progresses with high spreading rate, increasing need for intensive care and high intensive care mortality rate (5). The disease from a beta coronavirus family is also other family members such as MERS and SARS-COV, and their mortality is 9.6% and 34.4%, respectively (6,7). The intensive care hospitalization needs of the patients are between 5-20%, and the case mortality rates due to SARS-COV-2 vary between 0-16% in the world (8). However, the mortality rate is predicted to be lower due to the low number of cases detected.

In Turkey, the first case was detected on 10 March. To date, 190, 165 patients have been diagnosed and the number of mortalities is 5001 (9).

The disease shows a clinical presentation, ranging from an asymptomatic curse-especially in patients with comorbidity (diabetes, hypertension, heart failure) and in elderly patients-to cases requiring intensive care unit follow-up (10,11).

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What is known about the incidence of hospitalization in the intensive care unit of patients diagnosed to date and the clinical course of the disease and the factors affecting it are limited. This study aims to identify and compare epidemiological, demographic, clinical, laboratory markers and radiological features, as well as complications, treatment and outcomes of patients hospitalized in the intensive care unit due to SARS-COV-2. Potential risk factors and death related factors for severe Covid-19 were analyzed to provide scientific data to alleviate severity and reduce mortality.

MATERIAL AND METHOD

All authors research and declare that the rules of publication ethics are followed. The study was carried out with the permission of Research Ethics Committee Ümraniye Training and Research Hospital (Permission granted/CAAE number: 2020/28.04, Decision no: 132). All procedures were performed adhered to the ethical rules and the Helsinki Declaration of Principles.

Study Design

This study included all patients over the age of 18 who were admitted to the Intensive Care Unit of Sağlık Bilimleri University Sultan Abdülhamid Han Training and Research Hospital due to SARS COV 2 between 20 March and 8 June. 156 patients whom diagnosed with Covid-19 according to the WHO and Covid-19 guidebook of the ministry of health were included in the study.

Data collection

Case data includes demographic features, clinical features, laboratory results, radiological images, treatment options, and results. All patients included were clinically and/or laboratory (viral RNA detected by real-time PCR in oronasopharyngeal swabs) diagnosed and hospitalized patients over 18 years old. Chest x-ray and/or thoracic CT scan was used to confirm the diagnosis of pneumonia. There are no exclusion criteria.

Patients who had no fever for at least 3 days and whose respiratory functions improved significantly were taken to the clinics after being followed up in the intensive care unit.

Statistical Analysis

Because of the suitability of the Central Limit Theorem, parametric tests were used without testing normality (12). Non-parametric test statistics were used in laboratory measurement values with high deviations from the mean. In the analysis of the data, while performing the statistic given in the scales, the mean and standard deviation, minimum and maximum values of the features; When defining categorical variables, frequency and percentage values were used. Student's t test/Mann-Whitney U statistic is given to compare laboratory measurement values survived and nonsurvived group averages. Chi-square/z test statistics were used to evaluate the relationship between categorical variables. Exposure ratio (odds ratio) of variables thought to be related to death status are given. The statistical significance level of the data was taken as $p<0.05$. In the evaluation of the data, www.e-picos.com New York software and MedCalc statistics package program were used. Data collection was approved by the local Ethics Committee (17104_oss). The study was carried out in accordance with the Ethical Principles of the Helsinki Declaration and the Good Clinical Practice (GCP) guidelines of the International Conference on Harmonization (ICH).

RESULTS

The average age of 156 patients hospitalized in the intensive care unit from 20 March 2020 until 8 June 2020 was 69.3±15.2, of which 63.5% were male. Increasing age (OR:1.03; 95% Cl: 1.006-1.05; p=0.01) and dyspnea (OR: 2.3; 95% Cl: 1.1-4.4; p=0.02) were found to have a significant univariate association. The characteristics of the patients are shown in **Table 1.**

The presence of comorbidities (82%) was found to be significant as a bad prognostic factor. The most common of these were Hypertension (48.7%), second place Diabetes Mellitus (34.6%) and third place lung diseases (COPD, asthma, bronchiectasis) (32.1%) respectively. The presence of chronic kidney disease (CKD) and arrhythmia has been associated with mortality ($p<0.05$).

From application complaints, dyspnea (69.9%) was the most common symptom, correlation with cough and hemoptysis was found in mortality, and the mortality of patients admitted to the clinic with dyspnea was increased 2.3 times ($p<0.05$).

Widespread bilateral ground-glass opacity in chest tomography was 78% in total and was associated with mortality ($p<0.05$).

At the time of admission, a treatment protocol consisting of chloroquine (97%), an antiviral (94.8%), an antibiotic (99.4%) and azithromycin (76.3%) was applied. Tocilizumab was used in 27 patients (17.4%) and found beneficial for survival ($p<0.05$). There was no significant difference in other supportive treatments.

The fact that patients admitted to our intensive care unit from a different center other than our hospital services was associated with mortality. The mortality rate of patients coming from our hospital clinics is 4.13 times less. Patients intubated at the time of admission to intensive care unit are statistically significant in relation to mortality ($p<0.05$). 61% of the non-intubated patients were intubated later. Survival was proportional and correlated with high flow oxygen therapy mortality ($p<0.05$).

Table 1. Patient characteristics related to mortality

N=156		Total	Discharged n=59	Died n=97	
Characteristic		n (%)	n (%)	n (%)	p
Gender	Female	57 (36.5)	25 (42.4)	32 (33)	0.24*
	Male	99 (63.5)	34 (57.6)	65 (67)	
		$\bar{x}$±SD	$\bar{x}$±SD	$\bar{x}$±SD	
Age Median (25%-75%) Minimum-maximum		69.3±15.2 70 (59-81) 25-99	65.3±17.7 70 (51-80) 25-94	71.6±13.3 71 (62.5-81) 33-99	0.01**
Fever	Positive	95 (60.9)	35 (59.3)	60 (61.9)	0.75*
Cough	Positive	89 (57.1)	40 (67.8)	49 (50.5)	0.03*
Dyspnea	Positive	109 (69.9)	35 (59.3)	74 (76.3)	0.02*
Hemoptysis	Positive	7 (4.5)	-	7 (7.2)	0.03*
Lost of taste/smell	Positive	5 (3.2)	3 (5.1)	2 (2.1)	0.3*
Comorbidities	Positive	128 (82.1)	43 (72.9)	85 (87.6)	0.02*
Lung disease	Positive	50 (32.1)	15 (25.4)	35 (36.1)	0.17*
Coronary arter disease	Positive	37 (23.7)	13 (22)	24 (24.7)	0.7*
Diabetes mellitus	Positive	54 (34.6)	18 (30.5)	36 (37.1)	0.4*
Chronic heart failure	Positive	37 (23.7)	11 (18.6)	26 (26.8)	0.24*
Chronic kidney disease	Positive	20 (12.8)	3 (5.1)	17 (17.5)	0.02*
Cancer	Positive	16 (10.3)	7 (11.9)	9 (9.3)	0.61*
Hypertension	Positive	76 (48.7)	27 (45.8)	49 (50.5)	0.56*
Cerebrovascular disease	Positive	36 (23.1)	12 (20.3)	24 (24.7)	0.53*
Arrythmia	Positive	18 (11.5)	1 (1.7)	17 (17.5)	0.003*
Pneumonia	Positive	154 (98.7)	57 (96.6)	97 (100)	0.07
Chest computed tomography	Bilateral infiltrates	118 (78.1)	39 (68.4)	79 (84)	0.04*
Lymphopenia	Positive	142 (92.2)	55 (93.2)	87 (91.6)	0.71*
Non-invasive ventilation (NIV)	Positive	38 (24.4)	14 (23.7)	24 (24.7)	0.89*
High flow nasale canule					
(HFNC)	Positive	31 (19.9)	18 (30.5)	13 (13.4)	0.009*
Invasive mechanical ventilation					
(IMV)	Positive	108 (69.2)	14 (23.7)	94 (96.9)	<0.0001*
Tracheostomy	Positive	5 (3.2)	4 (6.8)	1 (1)	0.04*
Bedridden patients	Positive	24 (15.7)	9 (15.3)	15 (16)	0.91*
Arrival unit	Other ICU	20 (13.2)	6 (10.2)	14 (15.1)	0.08*
	Emergancy	54 (35.5)	16 (27.1)	38 (40.9)	
	Clinic	78 (51.3)	37 (62.7)	41 (44.1)	
ICU admission	Intubated	31 (20.3)	5 (8.5)	26 (27.7)	0.004*
	Non-intubated	122 (79.7)	54 (91.5)	68 (72.3)	
Intubation time (0.48)	First 1 hour	18 (25)	1 (11.1)	17 (27)	<0.001***
	First 24 hour	22 (30.6)	2 (22.2)	20 (31.7)	<0.0001***
	24-48 hour	9 (12.5)	2 (22.2)	7 (11.1)	0.02***
	48 hour-6 day	16 (22.2)	2 (22.2)	14 (22.2)	<0.0001***
	7 day and more	7 (9.7)	2 (22.2)	5 (7.9)	0.11***
Blood group	0	33 (29.5)	17 (35.4)	16 (25)	0.44*
	A	51 (45.5)	22 (45.8)	29 (45.3)	
	B	15 (13.4)	4 (8.3)	11 (17.2)	
	AB	13 (11.6)	5 (10.4)	8 (12.5)	
Blood culture	Positive	34 (32.7)	17 (40.5)	17 (27.4)	0.16*

*Significant at the level p<0.05 (*Chi-Square Test/**Student's t /***z test)

Follow-up with invasive mechanical ventilation (p<0.0001) and intubation took our attention as a bad prognostic factor. Our patients who underwent tracheostomy due to prolonged intubation were 5 patient and 4 of our patients were discharged (p<0.05). The blood type of 112 patients was examined; Group A was the most common (45.5%). However, mortality was not associated.

*Significant at the level p<0.05 (*Student's t/**Mann-Whitney U)

The effect of duration of hospitalization and total hospital stay on mortality is statistically significant (p<0.05). It was observed that the average length of stay in hospital was higher in the discharged patients. The mean values of the APACHE II score and SOFA score were significantly higher in predicting mortality (p<0.0001). It was found that the average APACHE II value was higher in deceased patient. It was observed that the mean arterial pressure (MAP) was lower and its effect on mortality is significant (p<0.05). When the difference between the averages of glucose, AST, total bilirubin (OR:2.94; 95% Cl: 1.22-7.07; p=0.03), Blood Urea Nitrogen (BUN) (OR:1.01; 95% Cl: 1.002-1.02; p=0.01), lactate dehydrogenase (LDH), troponin, D-dimer, C-reactive protein (CRP) factors according to mortality is evaluated statistically, a significant effect is observed (p<0.05).

When the difference between the averages of CRP/ALB (OR: 1.04; 95% Cl: 1.02-1.28; p=0.02) factor according to mortality is evaluated statistically, a significant effect is observed (p<0.05). It was found that the average CRP/ALB ratio was higher in deceased patients. When the difference between the mean of the Sedimentation factor according to mortality is evaluated statistically, a significant effect is observed (p<0.05). When the difference between the average of SaO_2 and PaO_2/FiO_2 factors according to mortality is statistically evaluated, a significant effect is observed (p<0.05). It was found that the average SaO_2 value was lower in patients who died. When the difference between the mean of Lactate (OR:1.54; 95% Cl: 1.09-2.19 p=0.01) factor (which is taken from arterial blood gas) by mortality is statistically evaluated, a significant effect is observed (p<0.05). It was found that the average Lactate level was higher in deceased patients (**Table 2**).

DISCUSSION

This study is based on comparing the epidemiological, demographic, clinical and treatment data of patients admitted to our intensive care unit for Covid-19 infection (survived vs dead) and to determine the effects of them to mortality.

Our study was compatible with other studies and the effect of age factor on mortality was found statistically significant (p<0.05) (13). In our study, male gender was more common in admission to intensive care, as men were caught with more Covid-19. However, its effect on mortality has not been associated with gender (14).

Half of the 370,000 confirmed Covid-19 cases that were symptomatic in the United States had cough symptoms (15). In our study cough (57%) was common and was associated with survival. In the same study 29% dyspnea was observed, and in our study, because of the only intensive care patients were included, the most common symptom was dyspnea with 69.9%, and just like hemoptysis (it was seen in 7 patients but all died) it was also associated with mortality (p<0.05) (15).

As seen in many studies, SOFA Score, D-dimer, CRP, median values were higher in patients who died than those who survived (16). APACHE II score was also a marker of mortality, but NLR and PLR rates were not significant in predicting mortality. In addition, the CRP/Albumin ratio is defined as a prognostic biomarker in many diseases (ICU acceptance in some studies) when exceeds a certain rate (17). This may be also one of the values to be used as a biomarker of mortality in SARS-COV-2.

Table 2. Patient treatments associated with mortality

Hydroxychloroquine sulfate	Positive	152 (97.4)	57 (96.6)	95 (97.9)	
Antibiotic	Positive	155 (99.4)	58 (98.3)	97 (100)	0.2*
Azythromycin	Positive	119 (76.3)	45 (76.3)	74 (76.3)	
Broad-spectrum antibiotics	Positive	144 (92.9)	53 (91.4)	91 (93.8)	0.57*
Antiviral	Positive	147 (94.8)	56 (94.9)	91 (94.8)	0.97*
Antifungal	Positive	21 (13.5)	8 (13.6)	13 (13.5)	
Corticosteroid	Positive	52 (33.5)	19 (32.2)	33 (34.4)	0.78*
IV Immunoglobulin	Positive	1 (0.6)	-	1 (1)	0.43*
Plasma	Positive	28 (18.2)	15 (25.4)	13 (13.7)	0.07*
IL-6 inhibitor (Tocilizumab)	Positive	27 (17.4)	18 (30.5)	9 (9.4)	0.001*
Low molecular weight heparin	proflactic	91 (58.3)	26 (44.1)	65 (67)	0.008*
	treatment dosage	58 (37.2)	31 (52.5)	27 (27.8)	
Colchicin	Positive	13 (8.3)	8 (13.6)	5 (5.2)	0.06*
Hemodialysis	Positive	21 (13.5)	4 (6.8)	17 (17.5)	0.06*
Vitamin C	Positive	127 (81.4)	45 (76.3)	82 (84.5)	0.2*
Cytokine filter	Positive	14 (9)	8 (13.6)	6 (6.2)	0.12*

*Significant at the level p<0.05 (*Chi-Square Test)

Table 3. Effects of variables on mortality

[N=153]	Total	Discharged (n=59)	Died (n=94)	p-value
Variable	**$\bar{x}$±SD**	**$\bar{x}$±SD**	**$\bar{x}$±SD**	
Symptom	9.2±11.8	10.4±1.5	8.4±7.4	0.3*
Clinical hospitalization (day)	7.2±5.9	9±6.1	4.8±5	0.001*
ICU hospitalization (day)	9.8±9.2	11.5±11.4	8.8±7.4	0.08*
Total hospitalization (day)	14.3±10.9	20.1±12.4	10.8±8.4	<0.0001*
APACHE II	25.48±8.3	20.77±6.05	28.35±8.25	<0.0001*
SOFA	5.94±3.23	4.05±2.11	7.1±3.3	<0.0001*
Heart rate rhythm/min.	101.01±23.56	100.44±23.35	101.01±23.81	0.81*
MAP	87.62±19.26	92±19.48	84.96±18.74	0.03*
Respiratory rate	30.84±10.6	31.61±8.09	30.38±11.8	0.48*
Leukocyte count	12.75±17.17	11.13±6.78	13.74±21.15	0.36*
Neutrophil	9.79±6.43	9.18±5.75	10.16±6.82	0.37*
Lymphocytes	0.95±0.65	0.97±0.5	0.94±0.73	0.8*
Neutrophil/lymphocyte	15.24±17.85	13.7±17.55	16.19±18.06	0.4*
Hemoglobulin	12.1±10.17	11.28±2.75	12.59±12.7	0.44*
Hematocrit	34.57±6.63	34.67±7.57	34.51±6.03	0.88*
Platelet	230.64±109.25	239.87±101.62	224.96±113.83	0.41*
Platelet/lymphocytes	353.01±383.42	333.18±357.91	365.32±398.25	0.61*
Glucose	154.19±99.93	128.36±55.1	169.79±116.64	0.01*
ALT	78.27±278.76	44.72±53.41	98.88±350.85	0.15**
AST	98.1±349.05	40.69±43.71	133.38±439.358	0.003**
Total bilurubin	0.88±1.17	0.64±0.3	1.05±1.4	0.03*
Direct bilurubin	0.47±1.01	0.27±0.16	0.6±1.27	0.05*
BUN	66.46±51.21	53.37±48.75	74.51±51.27	0.01*
Creatine	1.78±1.67	1.56±1.58	1.92±1.72	0.2*
LDH	775.27±570.75	614.22±317.22	874.25±663.79	0.006*
Troponin	1314.79±5621.78	501.9±3049.53	1818.44±6708.75	<0.0001**
BNP	772.25±1783.16	546.33±706.29	905.15±2179.33	0.89**
D-DIMER	3339.38±5258.96	2319.5±4418.56	3996.64±5662.29	0.01**
PT	15.76±4.11	15.21±3.29	16.1±4.53	0.19*
INR	1.33±0.43	1.28±0.34	1.36±0.48	0.24*
Fibrinogen	597.09±209.54	604.23±238.82	592.76±191.22	0.77*
Ferritin	1415.1±3048.28	1024.16±2733.02	1683.31±3235.13	0.19**
Prealbumin	11.41±9.71	13.21±9.42	10.47±9.86	0.32*
Albumin	3.05±2.11	3±0.48	3.08±2.67	0.81*
CRP	13.83±16.34	10.48±7.31	15.94±19.78	0.04*
CRP/ALB	4.52±3.51	3.66±2.97	5.07±3.72	0.02*
Procalcitonin	3.51±10.23	2.69±9.33	4.04±10.7	0.44*
Sedimentation	69.25±34.05	76.8±35.32	64.27±32.44	0.03*
Sodium	137.38±6.17	137.84±5.05	137.11±6.77	0.48*
Potassium	4.2±0.75	4.1±0.61	4.25±0.82	0.22*
SaO_2	86.2±10.5	88.87±9.18	84.68±10.94	0.02*
PaO_2	66.59±29.94	69.69±30.24	64.8±29.79	0.34*
SaO_2/ PaO_2	4.07±19.32	1.38±0.34	5.65±24.24	0.33**
PaO_2/FiO_2	128.79±59.61	158.41±61.18	111.45±51.55	<0.0001*
Lactate	2.53±2.58	1.83±0.97	2.92±3.09	0.01*

*Significant at the level p<0.05 (*Student's t /**Mann-Whitney U)

The SARS-COV-2 virus is an enveloped, single chain virus, and the angiotensin converting enzyme 2 (ACE2) Receptor is thought to be a major receptor for the viral spike protein and is critical for infectivity. Considering that ACE2 protein is found at high levels in the biliary system and liver, it suggests tissue injury (18). Available data on Covid-19 showed that the incidence of abnormal ALT/AST ranges from 14% to 53% (19). In our study, similarly to recent studies, AST values were higher than ALT values and AST was associated with mortality (p<0.05). In a study, the results of 6 studies in which bilirubin levels were measured were examined, and the results were found significantly higher in severe Covid-19 patients. In our study, total bilirubin and direct bilirubin levels were found associated with mortality significantly (p<0.05) (20,21).

Compared to patients in the surviving group, it is known that more frequent and more severe heart damage is observed in patients in the deceased group. One of the best indicator of this is that the high value of cardiac troponin I which is releated with cardiac damage caused by severe hypoxemia. In our study, cardiac troponin

I value was found to be associated with mortality (22). Therefore, it may be valuable to save time for repairing cardiac damage by providing the oxygenation necessary to damage reduce cardiac. It was determined that the high duration of hospitalization in the intensive care unit and clinic was associated with survival. This situation indicates the necessity of a strategy for the protection of vital organs of patients in intensive care unit.

In our study, HFNC use was 19.9% and NIV use was 24.4%. In other studies, HFNC use was 14-63% and NIV use was 11-56% (23-26). NIV use was not associated with survival or mortality, and HFNC use was associated with survival ($p<0.05$). A high mortality rate was encountered in patients intubated in our ICU. When we classified our patients who were followed up as non-intubated according to the time of intubation, the intubations performed within the first 7 days were found to be associated with mortality regardless of the intubation time. However, intubations performed after 7 days were not associated with mortality ($p<0.05$). Using other non-invasive respiratory supports without intubation may reduce mortality (10,23,27).

In addition, the lactate value of patients with SARS-COV-2 examined during the application to the emergency room was used as a criterion for acceptance from emergency to intensive care; in our study, lactate level at the time of admission to intensive care unit was found to be related to mortality (28).

A blood groups causes coagulapathy and has been associated with mortality (29). However, in our patient group, although most patients were A blood groups, this was not associated with mortality. Unfortunately, there is no treatment for Covid-19 pneumonia that has been appointed and proven to be effective. For this reason, all our patients received combined therapy consisting of hydroxychloroquine, at least one antiviral therapy (famipravir, oseltamivir, ritonavir liponavir), vitamin C and antibiotic therapy. In our study, no drug affecting survival was found among them. Cytokine storms mediated by overproduction of proinflammatory cytokines have been observed in a large population of critical patients infected with Covid-19 (20). In addition, combined therapies including steroids, colchicine, inhibition of IL-6, immunoglobulins and plasma therapy were also applied. Cytokine release syndrome is a systemic inflammatory response that is characterized by an increase in the level of a large number of pro-inflammatory cytokines and can develop for several reasons (30,31). In a study conducted in Italy, 179 of 544 severe covid patients were treated with tocilizumab, and mortality was reduced in these patients (32). In our study, only tocilizumab was determinant in mortality and influenced survival (22).

Table 4. Evaluation of factors affecting mortality

Variable	Odds ratio	Lower (95% CI)	Upper (95% CI)	p value
Age	1.03	1.006	1.05	(p<0.05)
Gender (female)	1.49	0.77	2.91	(p>0.05)
Duration of symptom	0.98	0.95	1.02	(p>0.05)
Fever	1.11	0.57	2.15	(p>0.05)
Cough	0.48	0.25	1.0001	(p>0.05)
Dispne	2.3	1.1	4.4	(p<0.05)
Hemoptysis	4.51	0.54	37.62	(p>0.05)
Loss of taste/smell	0.39	0.06	2.42	(p>0.05)
Contact	1.09	0.53	2.25	(p>0.05)
Admitted from clinic	4.13	1.49	11.47	(p<0.05)
Heart rate rhythm/ min.	1.002	0.98	1.01	(p>0.05)
MAP	0.98	0.96	1.001	(p>0.05)
Respiratory rate	0.98	0.96	1.02	(p>0.05)
Fever	1.46	0.74	2.92	(p>0.05)
Leukocyte count	1.01	0.98	1.05	(p>0.05)
Lymphopenia	0.79	0.23	2.75	(p>0.05)
Neutrophil/ lymphocyte	1.009	0.99	1.03	(p>0.05)
Hemoglobulin	1.02	0.95	1.1	(p>0.05)
Hematocrit	0.99	0.95	1.05	(p>0.05)
Platelet/ lymphocytes	0.98	0.97	1.001	(p>0.05)
Glucose	1.005	1.001	1.01	(p<0.05)
ALT	1.003	0.99	1.007	(p>0.05)
AST	1.007	0.99	1.01	(p>0.05)
Total bilurubin	2.94	1.22	7.07	(p<0.05)
BUN	1.01	1.002	1.02	(p<0.05)
Creatine	1.16	0.92	1.45	(p>0.05)
LDH	1.001	0.99	1.002	(p>0.05)
Troponin	0.98	0.96	1.001	(p>0.05)
BNP	0.99	0.98	1.001	(p>0.05)
D-dimer	0.97	0.96	1.0001	(p>0.05)
PT	1.06	0.97	1.17	(p>0.05)
INR	1.69	0.69	4.16	(p>0.05)
Fibrinogen	0.99	0.98	1.001	(p>0.05)
Ferritin	0.96	0.95	1.001	(p>0.05)
CRP/ALB	1.14	1.02	1.28	(p<0.05)
Sedimentation	0.98	0.97	1.001	(p>0.05)
SaO_2/PaO_2	1.52	0.61	3.75	(p>0.05)
PaO_2/FiO_2	0.98	0.97	1.0001	(p>0.05)
Lactate	1.54	1.09	2.19	(p<0.05)

In our intensive care unit, our mortality was 62.5%, but in many studies, mortality rates varies 26% to 78% (10,20,23,24,33). Here, treatment protocols, age, comorbidity, severity of disease and severity of acute respiratory distress syndrome (ARDS), differences between hospitals, may have caused different mortality rates.

CONCLUSION

With this study, we tried to find the factors predicting and affecting mortality. Thus, we aimed to identify patients who need careful observation and early intervention and to direct the clinician. Dyspnea was the most common symptom in admission to the intensive care unit, and was associated with mortality. We found that intubation is associated with mortality and using HFNC may reduce mortality. It was found useful to try non-invasive respiratory supports before intubation in the intensive care unit. Biochemical data (especially total bilirubin, direct bilirubin, glucose, BUN, lactate measured in arterial blood) obtained in admission to the intensive care unit were found to be helpful in predicting mortality.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Research Ethics Committee Ümraniye Training and Research Hospital (Permission granted/CAAE number: 2020/28.04, Decision no: 132).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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