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Evaluation of general characteristics of patients diagnosed with COVID-19 who were admitted to COVID-19 service and intensive care unit from the emergency department: a retrospective clinical study

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ABSTRACT

Aims: COVID-19 has caused many negative biological and psychological effects all over the world for a long time. Our aim is to present the general characteristics of patients who were diagnosed with COVID-19 by applying to the emergency department and who were admitted to the intensive care unit or service.

Methods: 1210 patients who were hospitalized in the emergency department, treated between 1 June 2020 and 1 January 2021, who had a positive COVID-19 Polymerase Chain Reaction test result and were examined retrospectively, were included in the study. $p<0.05$ was considered statistically significant.

Results: While the median age of patients admitted to the intensive care unit was 76, the median age of patients admitted to the service was 65 ($p<0.001$). The frequency of comorbidity rate in patients in intensive care was significantly higher than in the service. The most common symptoms were shortness of breath and cough. While lymphocyte and albumin levels were significantly lower in patients hospitalized in intensive care, white blood cell, C-reactive protein, procalcitonin, troponin I, D-dimer, urea, creatinine, and fibrinogen levels were significantly higher. When evaluated radiologically, the rate of lung CT retention was more common in patients hospitalized in intensive care.

Conclusion: This study determined that advanced age, the presence of comorbidities, high white blood cell, C-reactive protein, D-dimer, procalcitonin, urea, creatinine, and fibrinogen levels, low lymphocyte, albumin levels, and radiological involvement were also higher in patients admitted to intensive care.

Keywords: COVID-19, demographic features, intensive care, emergency department

INTRODUCTION

The biopsychosocial effects of coronavirus disease 2019 (COVID-19), which started in China in 2019 and caused the death of millions of people around the world, continue.[1,2] COVID-19 disease, was one of the leading causes of death in many countries, especially in 2020 and 2021.[3,4] According to World Health Organization (WHO) data, seven million people out of more than 770 million people contracted the disease by January 2024 have died due to COVID-19.[5]

It is essential for all physicians, especially emergency physicians, to diagnose this disease and determine the places for hospitalization. Emergency departments (EDs) are one of the most important places of application to healthcare systems for COVID-19 patients. Emergency services also serve to quickly diagnose possible patients, triage them, initiate appropriate treatment, intern them, ensure the isolation of patients, prevent cross-infections, and report cases to health authorities.

RT-PCR (reverse transcriptase polymerase chain reaction) test, which is a fast and sensitive method where gene expression analyses can be performed as a result of the synthesis of complementary DNA (cDNA) by RNA molecules isolated from cells with the help of the Reverse transcriptase enzyme isolated from retroviruses, is widely used in the diagnosis of COVID-19.[6,7] COVID-19 infection can cause a wide variety of changes in blood tests. Some of these tests can be used to predict the severity of the disease.[8] Lymphopenia, neutrophilia and thrombocytopenia, high troponin, D-dimer, and fibrinogen levels are some.[8]

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It is known that the disease causes lung damage through multiple mechanisms and lung computed tomography (CT) findings in the acute phase of the disease are clearly defined. One of the most essential advantages of CT imaging is the rapid visualization of lung involvement and its high sensitivity in detecting the early stages of the disease.[9] Consolidation, bilateral disease, the appearance of the "inverted halo" sign, "crazy pavement" pattern, linear opacities, greater total lung involvement, and peripheral lung distribution are expected findings in patients imaged with CT.[10]

With this study, after examining the general characteristics of patients diagnosed with COVID-19 and admitted to the service and intensive care unit (ICU) from the emergency department, We wanted to detect differences by comparing demographic, clinical, laboratory, and radiological features.

METHODS

Study Design

The study was conducted by the Declaration of Helsinki, Permission was obtained from the Ministry of Health for the study, and ethics committee approvals were obtained from the Ankara Bilkent City Hospital Ethics Committee (Date: 29/12/2021, Decision No: E1-21-2241).

The study retrospectively examined 1289 patients who applied to the hospital's emergency department, one of the largest hospitals in Turkiye, between June 1, 2020 and January 1, 2021. The principal and assistant researchers scanned the data from the hospital information system and doctor's orders. Patients over the age of 18 and patients whose data could be accessed were included in the study. As exclusion criteria, Patients whose data were not available, patients under the age of 18, patients with accompanying trauma, and pregnant women were accepted.

Data Collection

All patients' ages, genders, chronic diseases, admission complaints, physical examination findings, vital values, oxygen requirements, laboratory information, CT images, and hospitalization status were examined and recorded retrospectively. Oropharyngeal and nasal swap samples of all patients who applied to the emergency department with COVID-19 symptoms were taken by trained physicians as the Ministry of Health recommended and delivered to the laboratory in appropriate conditions and containers. Patients whose polymerase chain reaction (PCR) result was positive for COVID-19 were included in the study.

White blood cell (WBC), lymphocyte, C-reactive protein (CPR), procalcitonin (PRC), urea, creatinine, albumin, troponin I, D-dimer, and fibrinogen levels were analyzed.

The patients whose CT was taken and those who were not were separated, and their tomographic findings were examined. Consolidation, bilateral disease, appearance of the "inverted halo" sign, "crazy pavement" pattern, linear opacities, greater total lung involvement, and peripheral lung distribution were considered positive findings in patients imaged with CT.[10] Lung changes; divided into 5 groups based on measurement of the percentage of lung parenchymal involvement affected by COVID-19. 0, no lung involvement; 1 1-10%; 2 11-25%; 3 26-50%; 4 51-75%; 5 >75%.[11] Those with involvement were classified as for 0, no involvement, mild for 1-2, moderate for 3 and widespread involvement for 4-5, and other.

The hospitalization status of the patients was recorded. No scoring system was used for patients admitted to intensive care. Intensive care and service hospitalizations were provided according to the COVID-19 guide created by the Turkish Ministry of Health scientific committee.[12] Accordingly, patients with signs of respiratory failure, high oxygen demand, organ dysfunction and cardiac involvement, and circulatory disorders were admitted to intensive care. Dyspnea and respiratory distress, respiratory rate ≥30/min, PaO_2/FiO_2 <300, oxygen requirement increasing during monitoring, SpO_2<90% or PaO_2<70 mmHg despite 5 L/min oxygen therapy, hypotension, tachycardia, blood pressure >100/min, development of acute organ dysfunction such as acute kidney injury, acute liver function abnormalities, confusion, acute bleeding diathesis, and patients with immunosuppression, elevated troponin and arrhythmia, and lactate >2 mmol or presence of skin disorders such as capillary return disorder and cutis marmaratus were followed in intensive care units.[12]

Statistical Analysis

Armonk, NY, USA) ver 25 was used for analysis. The demographic descriptive data of the patients are expressed as n and %. the univariate analyses to identify variables associated with patient outcome using Chi-square, Fisher exact, student's t, and Mann-Whitney U test, where appropriate. For the multivariate analysis, possible factors identified with univariate analyses were further entered into the logistic regression analysis to determine independent predictors of hospitalization. Hosmer-Lemeshow goodness of fit statistics were used to assess model fit. The alpha error of the study was accepted as 0.05.

RESULTS

1289 patients hospitalized with a diagnosis of COVID-19 between 01 June 2020 and 01 January 2021 were evaluated. 1210 patients were included in the study. Of the 79 patients, 24 were pregnant and 15 were trauma patients, so they were excluded from the study. 21 patients were not included in the study because they were not hospitalized. The remaining 29 patients were not included in the study because their data could not be accessed. These patients were admitted to COVID-19 services and intensive care units from the emergency room. Demographic radiological characteristics and laboratory values of these two groups were compared.

Information about the demographic data and symptoms of all patients is given in Table 1. Mostly male patients take part in the study (52.7%). The mean age is 64.5 years (min 19-max 100). The most common comorbid disease is hypertension (HT) (n: 495). The most common presenting symptoms are dyspnea (n: 421) and cough(n: 370). The least common application complaint is loss of taste sense (n:4). 76.4% of the patients are admitted to the service, and 23.6% were admitted to the ICU.

When we examine the radiological imaging of hospitalized patients, the most common involvement is detected in lung CT (Table 1).

Table 1. Demographic data of patients and data on emergency department admission symptoms

		n (%)
Gender	Female	572 (47.3)
	Male	638 (52.7)
Age, years	Mean (range)	64.5 (min 19-100 max)
	Median	67
Comorbidity	No	424 (35)
	Yes	786 (65)
	Total	1210
HT[a]		495 (41)
DM[b]		319 (26.4)
Other Diseases[c]		246 (20.3)
CAD[d]		202 (16.7)
Astma		73 (6)
COPD[e]		67 (5.5)
Malignancy		64 (5.3)
CHF[f]		42 (3.5)
CRD[g]		28 (2.3)
Emergency department admission symptoms*		
Dyspnea		421 (34.8%)
Cough		370 (30.6%)
Weakness		335 (27.7%)
Fever increased		270 (22.3%)
Myalgia		193 (16.0%)
Diarrhea		73 (6.0%)
Headache		66 (5.5%)
Throat pain		62 (5.1%)
Anosmia		20 (1.7%)
Loss of taste sense		4 (0.3%)
Radiological disease severity[h]	0 None	119 (9.8)
	1-2 Light	158 (13.1)
	3 Medium	292 (24.1)
	4-5 Common	563 (46.5)
	Other[i]	78 (6.4)
Hospitalization	Service	925 (76.4)
	ICU[j]	285 (23.6)

*More than one symptom of a patient was recorded, a) Hypertension, b) Diabetes mellitus, c)Alzheimer's, Parkinson's, rheumatoid arthritis, epilepsy, rhythm disorders, thyroid diseases, d) Coronary artery disease, e) Chronic obstructive pulmonary disease, f) Congestive heart failure g) Cronic renal disease, h) There is 78 missing data i) Isolated lobar or segmental consolidation, discrete small nodules, cavitation or interlobular septal thickening, pleural effusion j) Internal care unite, HT: Hypertension, DM: Diabetes mellitus, CAD: Coronary artery disease, COPD: Chronic obstructive pulmonary disease, CHF: Congestive heart failure, CRD: Chronic respiratory disease, ICU: Intensive care unit

Table 2 shows the data distribution of vital signs and laboratory parameters. Median blood pressure is measured as 123/70 mmHg, median pulse is 93 (min 36-max 169). Oxygen saturation median is 92% (min 40%-max 100%). The median levels of hematological parameters are found to be like that; WBC 6.02 (3,9-10,2) x10^9/L, lymphocyte 0.06 (1,1- 4,5) x10^9/L, CRP 0.06 (0-5) mg/L, D-dimer 0.855 (0-0,55) mg/L, PRC 0.077 (0-0,16) µg/ L, urea 9 (19-49) mg/dL, creatinine 1 (0,5-1,1) milligram/desiliter, fibrinogen 4.52 (1,7-4,2) g/L, albumin 41 (32-48) g/L, troponin 9 (0-45) ng/L.

Table 2. Data distribution table of patients' vital signs and laboratory parameters

	Median	Range (min-max)
Systolic blood pressure (n: 520)*	123	69-256
Diastolic blood pressure (n: 520)*	70	36-130
Pulse (n: 570)*	93	36-169
Oxygen level % (n: 836)*	92	40-100
Fever (n: 617)*	36.7	35-40
Hematological parameters		
WBC[a] 10^9/L (n:1185)*	6.02	0.880-146.4
Lymphocyte 10^9/L (n:1186)*	0.99	0.1-114.4
CRP[b] mg/L (n:1037)*	0.06	0-0.90
D-dimer mg/L (n: 1092)*	0.855	0.008-80
PRC[c] µg/L (n: 1056)*	0.077	0.01-216.2
Urea mg/dL (n: 1153)*	9	0.02-250
Creatinine mg/dL (n: 1168)*	1	0.2-72
Fibrinogen g/L (n: 615)*	4.52	1-325
Albumin g/L (1176)*	41	19-53
Troponin ng/L (1153)	9	0.02-25000

a: White blood cell, b: C-reactive protein, c: Procalcitonin, *There is missing data, so data numbers are stated in parentheses, WBC: White blood cell, CRP: C-reactive protein, PRC: Procalcitonin

While the number of patients admitted to COVID-19 services from the emergency department is 925 (76.5%), the number of patients admitted to intensive care is 23.5%, with 285 patients (Table 3). Table 3 compares the patient's demographic data and symptoms at presentation to the emergency department for patients hospitalized in the service and those in the ICU. While the mean age of patients admitted to the service is 62, the median age of patients admitted to the ICU is 73 ($p<0.001$). The malignancy rate is significantly higher in patients hospitalized in ICU ($p=0.010$). COPD, one of the comorbid diseases, is more significant for service admission than ICU admission ($p=0.018$). Among the symptoms, anosmia, weakness, cough, myalgia dyspnea, and the presence of oxygen need are found to be more significant for hospitalization ($p=0.032$, $p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$, respectively). When radiological disease severity is examined, service and ICU hospitalization rates of patients with widespread disease severity are significantly higher ($p<0.001$).

Table 3. Comparison of demographic data and symptoms of hospitalized service and ICU patients*

		Service inpatient n=925 (76.5%)	ICU inpatients n=285 (23.5%)	p
Gender	Female	444 (48%)	128 (45%)	0.378
	Male	481 (52%)	157 (55%)	
Age, years	Mean (range)	62 (min 19-max 97)	73 (min 30-max 100)	<0.001
	Median	65	76	<0.001
Comorbidities	Yes	588 (63%)	198 (69%)	0.039
	No	337 (37%)	87 (31%)	
HT[a]		369 (39.9%)	126 (44.2%)	0.215
DM[b]		240 (25.9%)	79 (27.7%)	0.590
Malignancy		40 (4.3%)	24 (8.4%)	0.010
CAD[c]		147 (15.9%)	55 (19.3%)	0.203
CHD[d]		28 (3%)	14 (4.9%)	0.139
COPD[e]		43 (4.6%)	24 (8.4%)	0.018
CRD[f]		18 (1.9%)	10 (3.5%)	0.173
Asthma		61 (6.6%)	12 (4.2%)	0.156
Other disease		186 (20.1%)	60 (21.1%)	0.729
Emergency department admission symptoms				
Dyspnea		274 (29.6%)	147 (51.6%)	<0.001
Cough		309 (33.4%)	61 (21.4%)	<0.001
Weakness		278 (30.1%)	57 (20%)	<0.001
Fever increased		218 (23.6%)	52 (18.2%)	0.062
Myalgia		176 (19%)	17 (6%)	<0.001
Headache		62 (6.7%)	4(1.4%)	<0.001
Diarrhea		59 (6.4%)	14(4.9%)	0.224
Throat pain		51 (5.5%)	11 (3.9%)	0.171
Anosmia		19 (2.1%)	1 (0.4%)	0.032
Loss of teste sense		4 (0.4%)	0 (0%)	0.341
Oxygen need		183 (19.8%)	138 (48.4%)	<0.001
Radiological disease severity	0 None	102 (11%)	17 (6%)	<0.001
	1-2 Light	137 (14.8%)	21 (7.4%)	
	3 Medium	235 (25.4%)	57 (20%)	
	4-5 Common	383 (41.4%)	180 (63.2%)	
	Other[g]	68 (7.4%)	10 (3.5%)	

a) Hypertension, b) Diabetes mellitus, c) Coronary artery disease, d) Coronary heart disease, e) Chronic obstructive pulmonary disease, f) Cronic renal disease, g) Isolated lobar or segmental consolidation, discrete smallnodules, cavitation or interlobular septal thickening, pleural effusion j) Internal care unite *Column percentage used, HT: Hypertension, DM: Diabetes mellitus, CAD: Coronary artery disease, CHD: Coronary heart disease, COPD: Chronic obstructive pulmonary disease, ICU: Intensive care unit

Logistic regression analysis was performed for data affecting service and ICU admission (Table 4). Variables found to be statistically significant in univariate analyses were included in the model. Nagelkerke R square value was determined as 0.269. Age (p<0.001, B=0.40), dyspne (p=0.003, B=0.562), cough (p<0.001, B=1.079), radiological disease severity (p=0.006, B=0.240) are required for ICU admission, was found to be significant. Myalgia symptom is a determinant for hospitalizations (p=0.022, B=-0.682). The overall percentage accuracy in predicting service and ICU admission of patients is 77%.

Table 4. Logistic regression analysis of data in terms of service and ICU admission

Variable	B	p	EXP (B)	95% CI for EXP (B)	
				Lower	Upper
COPD[a]	0.022	0.947	1.022	0.535	1.951
Malignancy	0.635	0.076	1.888	0.935	3.809
Age, years	0.040	0.000	1.040	1.027	1.054
Dyspnea	0.562	0.003	1.755	1.218	2.529
Cough	1.079	0.000	2.941	2.049	4.221
Weakness	-0.264	0.212	0.768	0.507	1.163
Comorbidities	0.320	0.147	1.377	0.894	2.121
Headache	-0.763	0.226	0.466	0.135	1.604
Myalgia	-0.682	0.022	0.506	0.281	0.908
Anosmia	-0.958	0.378	0.384	0.046	3.231
Radiological disease severity	0.240	0.006	1.271	1.071	1.507
Constant	-4.947	0.000	0.007		

Dependent variable encoding: ICU=1, COPD: Chronic obstructive pulmonary disease

Table 5 compares the patient's vital values and laboratory parameters for service and ICU admission. The decrease in oxygen saturation, one of the patient's vital signs, are significant for ICU hospitalization (p<0.001). Increased WBC, CPR, D-dimer, PRC, urea, troponin, creatinine, and fibrinogen levels are significant for ICU admission. (p<0.001, p<0.001, p<0.001, p<0.001, p<0.001, p<0.001, p<0.001, respectively). The decrease in lymphocyte and albumin values are significant for ICU admission (p<0.001).

DISCUSSION

In this study, the median age of all patients admitted to the emergency department and hospitalized is 67 years. In another study by Huang et al.,[13] the median age of all hospitalized patients was found to be 49 years. In another study by Hocanlı et al.,[14] the median age of hospitalized patients was 42 years. We think that the higher age of all inpatients in this study compared to other studies is due to the larger population of elderly patients admitted to the hospital.

While the median age of patients admitted to the service is 65, the median age of patients admitted to the intensive care unit is 76, significantly higher than those admitted. It was determined that the patients admitted to intensive care were older than those admitted to the service. In another study conducted by Bastug et al.[15] in the same center, which lasted for two months and included 46 patients, the median age of patients admitted to intensive care was determined to be

Table 5. Comparison of patients' vital and laboratory parameters with service admission and ICU admission			
	Service Inpatients Median (Range)	ICU[d] Inpatients Median (Range)	p
Vital signs			
Systolic blood pressure (n: 520)*	123.5 (70-256)	120 (69-192)	0.160
Diastolic blood pressure (n: 520)*	69 (40-130)	70 (36-120)	0.321
Pulse (n: 570)*	93 (36-160)	90 (43-169)	0.401
Oxygen saturation %	93 (64-100)	88 (40-99)	<0.001
Fever (n: 617)*	36.7 (35-39.1)	36.5 (35-40)	0
Laboratuvar parameters			
WBC[a] 10^9/L (n: 1185)*	5.715 (0.880-85.620)	7.290 (1.020-146.400)	<0.001
Lymphocyte 10^9/L (n: 1186)*	1.040 (0.1-394)	0.840 (0.150-114.400)	<0.001
CRP[b] mg/L (n: 1037)*	0.05 (0.01-0.90)	0.12 (0.01-0.32)	<0.001
D-dimer mg/L (n: 1092) *	0.780 (0.008-80)	1.30 (0.07-50.90)	<0.001
PRC[c] µg/L (n: 1056)*	0.05 (0.01-216.20)	0.180 (00.03-41.53)	<0.001
Urea mg/dL (n: 1153)*	6 (0.02-3068)	23.50 (2-250)	<0.001
Creatinine mg/dL (n: 1168)*	0.96 (0.20-72)	1.15 (0.36-37)	<0.001
Fibrinogen g/L (n : 615)	4.4 (1.04-325)	5.225 (1.87-9.00)	<0.001
Albumin g/L (n: 1176)*	41 (23-53)	37 (19-52)	<0.001
Troponin I ng/L (n: 1153)*	6 (0.02-3068)	23.5 (2-25000)	<0.001

a: White blood cell, b: C-reactive protein, c: Procalcitonin, d: Intensive care unite, *There is missing data, so data numbers are in parentheses, ICU: Intensive care unit, WBC: White blood cell, CRP: C-reactive protein

71 years old. It is thought that the difference may be due to the difference in study duration and number of patients. In Huang's study,[13] 73% of infected patients were male. As in this and other similar studies, male gender was more common in all hospitalized patients in our study (52.7%).[16] While the number of patients admitted to the service is 76.5%, the rate of patients admitted to the intensive care unit is 23.5% patients. There is more male gender than female gender in both intensive care and service patients In the study conducted by Wang et al.,[17] patients treated in intensive care were older compared to patients not treated in intensive care, which supports our study. (median age, 66 years vs 51 years). In a meta-analysis conducted on 59 studies, consistent with this study, it was determined that the rates of COVID-19 infection, serious illness, and intensive care admission were higher in men and patients aged 70 and over.[16]

When we evaluated the comorbidities of inpatients, the number of patients with no comorbidities was 35%, 424, while the number of patients with comorbidities was 786, with a rate of 65%. The most frequently observed comorbidity was HT (41%), followed by diabetes mellitus (DM). In another study by Zhou et al.,[18] 48% of hospitalized patients had a comorbid disease, the most common being HT (30%), and they confirmed that disease severity was significantly higher in patients presenting with HT.

While the most common initial symptoms of COVID-19 disease are fever, cough, fatigue, headache, and myalgia, many people with COVID-19 may also experience gastrointestinal symptoms such as nausea, vomiting, or diarrhea before fever and lower respiratory tract symptoms appear.[19] Some patients experienced loss of smell or taste before respiratory symptoms began.[19] The disease, which is severe enough to require hospitalization, usually progresses with symptoms such as shortness of breath accompanied by hypoxemia after a week.[13] Since outpatients were not included in our study and only patients who required hospitalization were examined, we think that the most common presenting symptom is shortness of breath.

It is known that COVID-19 causes changes in some routine blood values. When the hematological parameters in the study are evaluated, the decrease in lymphocyte and albumin levels and the increase in leukocyte, D-dimer, creatinine, and fibrinogen levels are the distinguishing features of critical COVID-19 patients.

D-dimer, a fibrin breakdown product, and additionally fibrinogen, are known to be elevated in COVID-19 patients. In this study, the average d-dimer level of patients hospitalized in the service is 0.78 milligram/liter, while it is 1.3 in patients hospitalized in the intensive care unit, which is statistically

significant. The study conducted by Samadja et al.[20] is similar to our study. D-dimer levels were higher in patients in the ICU than in patients in medical service.

Zhang et al.[21] stated that D-dimer levels are important in determining mortality in cases of COVID-19 pneumonia.

One of the studies that concluded that high fibrinogen levels are associated with excessive inflammation, disease severity, and admission to intensive care in COVID-19 patients is the study of Sui and his team. [22] Again, in a meta-analysis by Mehrdad et al.,[23] it was reported that fibrinogen and D-dimer can be used as markers in predicting severe disease in COVID-19 patients, which is correlated with our study.

High D-dimer and fibrinogen levels show that they are associated with intensive care unit admission in COVID-19. Therefore, we think that early recognition of abnormal coagulation findings and monitoring for coagulopathy are essential and highly recommended to support COVID-19 patients for understanding the severity of the disease and prognosis, intensive care admission, the regulation and early initiation of anticoagulant treatment, improve their clinical outcomes, and reduce severe complications.

Widespread involvement was found in 63.2% of patients admitted to intensive care. One of the most important points in the management of patients with COVID-19 pneumonia who need to be admitted to the emergency room is to decide whether the patients will be admitted to the intensive care unit or not, and another is to decide whether mechanical ventilation is required. Although these decisions depend on multiple factors such as patients' clinical conditions, comorbidities, and disease severity, delay in treatment may affect the outcome of the disease. Therefore, CT imaging is another key point to consider in the decision-making process. The study conducted by Cau et al.,[24] in which they compared patients admitted to the intensive care unit and the ward, showed that involvement was significantly different in patients admitted to the intensive care unit, consistent with ours. Baştuğ et al.'s[15] study, in correlation with ours, showed that advanced radiological abnormalities were more common in the intensive care group. The most important limitation of this study is that the scoring system is not used. Considering that COVID-19 is a global pandemic, another of the biggest limitations is that it was single-center. A retrospective study and short- and long-term follow-up of the patients and information about the prognosis would have made additional contributions to our study.

The study's strength is that it was conducted in one of the centers considered to be Turkiye's COVID-19 center and included a sufficient number of patients

CONCLUSION

In summary, this study showed that age, shortness of breath, cough, myalgia symptoms, and radiological disease severity were significant for admission to the intensive care unit. While the decrease in oxygen saturation, one of the vital signs of the patients, was found to be significant, increased WBC, CPR, D-dimer, PRC, urea, troponin, creatinine and fibrinogen levels and decreases in lymphocyte and albumin values were found to be important for admission to the intensive care unit.

We believe that identifying undesirable predictors of poor outcome in COVID-19 from clinical or laboratory parameters is valuable in terms of early diagnosis and intervention of the course of the disease, making more individualized treatment plans, and more efficient use of medical resources in case of an epidemic. We also think that it will be important to monitor hemostasis parameters that predict mortality, to cope with thrombotic processes that are important in mortality, and to develop adequate anticoagulation application guidelines specifically for these patients in order to plan appropriate anticoagulant treatment when necessary. It is critical to continue improving international surveillance, cooperation, coordination, and communication about this major epidemic and to be even better prepared to respond to new epidemic threats in the future. As a result, we believe that this study will contribute to the surveillance by supporting the diagnosis of COVID-19 infection, which affects almost all systems, with radiological imaging and multidisciplinary evaluation of patients with laboratory and clinical findings.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was obtained from the Ministry of Health for the study and ethics committee approvals were obtained from the Ankara Bilkent City Hospital Ethics Committee (Date: 29/12/2021, Decision No: E1-21-2241).

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.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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