

Demographic Characteristics of Patients with Possible or Definitive COVID-19 Diagnosis Transported by 112 Emergency Health Services Ambulance

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ABSTRACT

Objective: The aim of this study was to examine the demographic characteristics of possible and definitively diagnosed coronavirus disease 2019 (COVID-19) patients transported by ambulance through the national 112 emergency health services telephone number.

Methods: This study was conducted retrospectively using data from patients diagnosed with or suspected of having COVID-19 who were transported to hospital in Ankara by ambulance. Calls to the 112 emergency services call center between March 11, 2020 and May 11, 2020 were examined, and all of the relevant patients over the age of 18 transported by ambulance were included in the study.

Results: Ambulances were dispatched to 107,173 cases during the study period. In all, 11,345 possible COVID-19 cases were transferred to hospitals and 856 (7.5%) of these patients were subsequently diagnosed with COVID-19 based on a polymerase chain reaction test. Of the patients diagnosed with COVID-19, 50.6% were women. The mean age of the entire group was 50.6 ± 18.7 years. The triage code of the COVID-19-positive patients was 57.1% yellow, 37.1% green, and 5.7% red. Urban residents constituted 95.7% of the patients with a positive COVID-19 diagnosis.

Conclusion: Infection with severe acute respiratory syndrome 2 virus, which causes COVID-19, spread quickly and was declared a pandemic in early 2020. The rapidly increasing case numbers and the high morbidity rate caused widespread anxiety. Descriptive data, such as age and gender distribution, sociocultural characteristics, and symptoms, of patients attended to by emergency medical service units will help to determine prevalence and risk, and provide important information for public health management.

INTRODUCTION

Reports of pneumonia of unknown cause were issued in China in late 2019, and in March of the following year, the World Health Organization declared coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome 2 virus (SARS-CoV-2), a pandemic and a public health emergency.^[1-3] Confirmation of COVID-19 is most often based on a real-time polymerase chain reaction (RT-PCR) test.^[4,5] The first case in Turkey was reported on March 11, 2020.^[6]

Emergency health services provide immediate assistance and transport patients to the hospital. Ambulances are called to serve in a variety of circumstances, including disaster situations, and these teams have been a significant element of the provision of care during the COVID-19 pandemic.

Analysis of the demographic data of the patients attended to by emergency service units during the present pandemic can provide important information for disease control. The objective of this study was to examine the demographic characteristics of possible and definitively diagnosed COVID-19 patients transported by ambulance dispatched by the emergency health services.

MATERIALS AND METHODS

Approval for this study was received from the University of Health Sciences Dr. Abdurrahman Yurtaslan Oncology Health Application and Research Center Clinical Research Ethics Committee on May 20, 2020 (no: 2020/5/607).

This study was conducted retrospectively, using data from patients with a diagnosis or the suspicion of COVID-19 who were transported to the hospital by ambulance. All of

the calls to the Ankara 112 emergency call center received between March 11 and May 11, 2020 were examined, and possible COVID-19 patients over the age of 18 who were

transferred by ambulance were included in the study. The diagnosis of the disease was based on a positive RT-PCR test.

Details of patient age, gender, nationality, region of residence, comorbid diseases, complaints/symptoms, time of the call to the emergency services call center, and the triage code assigned to the patients included in the study were recorded and analyzed.

Table 1. Calls to the emergency call center

	March 11–June 11 2020
Total calls	539573
Total responses	522661
Ambulance response	107173
Possible COVID-19 cases	11345

Statistical analysis

The data analysis was conducted using IBM SPSS Statistics for Windows, Version 25.0 software (IBM Corp., Armonk, NY, USA). Descriptive statistics (periodicity, percentage,

Table 2. Patient characteristics according to PCR test results

		PCR (-) (n=10.489)	PCR (+) (n=856)	p
Sex, n (%)	Female	5027 (47.9)	433 (50.6)	0.135 ^a
	Male	5462 (52.1)	423 (49.4)	
Age (years), mean±SD	Total	53.7±21.0	50.6±18.7	0.000 ^b
	Female	55.4±20.9	50.3±18.7	0.000 ^b
	Male	52.1±20.9	50.9±18.7	0.253 ^b
	P	0.000 b	0.591 b	
Age group (years), n (%)	<65	6619 (63.1)	636 (74.3)	0.000 ^a
	≥65	3870 (36.9)	220 (25.7)	
Time of emergency call, n (%)	00:00–07:59 1	1997 (19.0)	113 (13.2)	0.000 ^a
	08:00–15:59 2	4410 (42.0)	412 (48.1)	
	16:00–23:59 3	4082 (38.9)	331 (38.7)	
Triage group, n (%)	Green code 1	3244 (30.9)	318 (37.1)	0.003 ^a
	Yellow code 2	6496 (61.9)	489 (57.1)	
	Red code 3	749 (7.1)	49 (5.7)	
Urban/rural, n (%)	Urban	9965 (95.0)	819 (95.7)	0.382 ^a
	Rural	524 (5.0)	37 (4.3)	
Nationality, n (%)	Turkish	10120 (96.5)	839 (98.0)	0.017 ^a
	Foreign	369 (3.5)	17 (2.0)	
Fever, n (%)	Present	9525 (90.8)	818 (95.6)	0.000 ^a
	Absent	964 (9.2)	38 (4.4)	
Cough, n (%)	Absent	9521 (90.8)	799 (93.3)	0.012 ^a
	Present	968 (9.2)	57 (6.7)	
Pain, n (%)	Absent	9734 (92.8)	845 (98.7)	0.000 ^a
	Present	755 (7.2)	11 (1.3)	
Dyspnea, n (%)	Absent	9942 (94.8)	835 (97.5)	0.000 ^a
	Present	547 (5.2)	21 (2.5)	
Fatigue-myalgia, n (%)	Absent	10346 (98.6)	842 (98.4)	0.615 ^a
	Present	143 (1.4)	14 (1.6)	
Cardiac arrest, n (%)	Absent	10419 (99.3)	853 (99.6)	0.372 ^a
	Present	70 (0.7)	3 (0.4)	
Hypertension, n (%)	Absent	10300 (98.2)	852 (99.5)	0.006 ^a
	Present	189 (1.8)	4 (0.5)	
Diarrhea, n (%)	Absent	10430 (99.4)	854 (99.8)	0.206 ^a
	Present	59 (0.6)	2 (0.2)	
Nausea vomiting, n (%)	Absent	10151 (96.8)	851 (99.4)	0.000 ^a
	Present	338 (3.2)	5 (0.6)	
Sore throat, n (%)	Absent	10243 (97.7)	852 (99.5)	0.000 ^a
	Present	246 (2.3)	4 (0.5)	

a: Chi-squared test; b: Independent samples t-test. PCR: Polymerase chain reaction; SD: Standard deviation.

Table 3. Patient characteristics according to PCR test results

		PCR (-) (n=10.489)	PCR (+) (n=856)	p
Sex, n (%)	Female	5.027 (92.1)	433 (7.9)	0.135 ^a
	Male	5.462 (92.8)	423 (7.2)	
Age (years), mean±SD		53.7±21.0	50.6±18.7	0.000 ^b
	Female	55.4±20.9	50.3±18.7	0.000 ^b
	Male	52.1±20.9	50.9±18.7	0.253 ^b
	P	0.000 ^b	0.591 ^b	
Age group (years), n (%)	<65	6.619 (91.2)	636 (8.8)	0.000 ^a
	≥65	3.870 (94.6)	220 (5.4)	
Time of call, n (%)	00:00–07:59	1.997 (94.6)	113 (5.4)	0.000 ^a
	08:00–15:59	4.410 (91.5)	412 (8.5)	
	16:00–23:59	4.082 (92.5)	331 (7.5)	
Triage group, n (%)	Green code 1	3.244 (91.1)	318 (8.9)	0.003 ^a
	Yellow code 2	6.496 (93.0)	489 (7.0)	
	Red code 3	749 (93.9)	49 (6.1)	
Urban/rural, n (%)	Urban	9.965 (92.4)	819 (7.6)	0.382 ^a
	Rural	524 (93.4)	37 (6.6)	
Nationality, n (%)	Turkish	10.120 (92.3)	839 (7.7)	0.017 ^a
	Foreign	369 (95.6)	17 (4.4)	

a: Chi-squared test; b: Independent samples t-test. PCR: Polymerase chain reaction; SD: Standard deviation.

mean, SD) were calculated, and a chi-squared (2) test was used to compare qualitative data. The distribution was evaluated with the Kolmogorov-Smirnov and Shapiro-Wilk tests. An independent samples t-test was used to compare normally distributed data of independent groups. A p value <0.05 was considered significant and indicated a difference between groups.

RESULTS

The health unit of the emergency call center received a total of 539,573 calls between March 11 and June 11, 2020. The medical team at the emergency call center dispatched ambulances to 107,173 cases. Following an on-scene evaluation of the patient by the team, 11,345 possible COVID-19 cases (code Z03.8 ICD) were transferred to hospitals (Table 1).

In all, 856 (7.5%) of these patients were definitively diagnosed with COVID-19 at the hospital based on PCR test results. Of the COVID-19 patients, 50.6% were women. The mean age of the entire study group was 50.6±18.7 years; 636 (74.3%) of the patients diagnosed with COVID-19 were under the age of 65. The 112 emergency calls of COVID-19 positive patients occurred most frequently between 8 am and 4 pm (48.1%) and between 4 pm and midnight (38.7%). The triage code assigned to 57.1% of the COVID-19-positive patients was yellow, 37.1% were tagged with a green code, and 5.7% were classified as a red-level priority. Urban residents constituted 95.7% of the COVID-19 positive patients, and 2% were foreign nationals. The most common complaints of the patients with a positive PCR test result were a cough,

fever, dyspnea, fatigue/malaise, and nausea/vomiting (Table 2).

There was no significant difference in gender between the patients who were diagnosed with COVID-19 and those who were not (p>0.05). The mean age of females who tested positive for COVID-19 was significantly lower than that of those with a negative result (p<0.05) (Table 3).

The presence of the symptoms of fatigue/malaise and diarrhea did not represent a statistically significant difference in the ultimate COVID-19 diagnosis (p>0.05). There was a significant difference in the symptoms of a cough, fever, pain, shortness of breath, nausea/vomiting, and a sore throat between patients who were diagnosed with COVID-19 and those who were not (p<0.05) (Table 4).

Table 4. Symptoms at presentation according to PCR test results

	PCR (-) (n=10.489)	PCR (+) (n=856)	p*
	n (%)	n (%)	
Cough	968 (94.4)	57 (5.6)	0.012
Fever	964 (96.2)	38 (3.8)	0.000
Pain	755 (98.6)	11 (1.4)	0.000
Dyspnea	547 (96.3)	21 (3.7)	0.000
Emesis/vomiting	338 (98.5)	5 (1.5)	0.000
Sore throat	246 (98.4)	4 (1.6)	0.000
Fatigue/myalgia	143 (91.1)	14 (8.9)	0.615
Diarrhea	59 (96.7)	2 (3.3)	0.206

*: Chi-squared test. PCR: Polymerase chain reaction.

DISCUSSION

The epidemiology of COVID-19 varies between countries. Possible reasons for this include differences in demographic and sociocultural structure, the extent of national and international travel, and the capacity, accessibility, and versatility of healthcare systems. As long as the epidemic continues, demographic data are needed to raise and maintain public awareness and to guide disease intervention strategies.

Some reports in the literature have noted gender-related differences in the prevalence and severity of COVID-19 infection.^[7,8] Studies conducted in China reported that the disease was more common in men, and it has been observed that this may be due to lifestyle characteristics, such as a greater prevalence of smoking among men, and hormonal and genetic factors influencing the expression of angiotensin-converting enzyme 2, the functional receptor for SARS-CoV-2.^[9] While a high prevalence of male gender has been reported in some studies conducted in Turkey,^[10,11] other research indicated a female sex ratio of 52.6%.⁵ Our study revealed that 50.6% of the PCR-positive patients were female.

Although COVID-19 patients often present with upper and lower respiratory tract symptoms, patients may also have less common symptoms, such as headache or diarrhea. Common clinical symptoms in an epidemiological study of 1099 confirmed cases included a fever (88.7%), cough (67.8%), fatigue (38.1%), sputum (33.4%), shortness of breath (18.6%), sore throat (13.9%), and headache (13.6%).⁷ In another study that examined the demographic data of 137 patients, the primary symptoms were a fever (81.8%), cough (48.2%), and muscle pain or fatigue (32.1%), with less common reports of diarrhea and.^[12] In our study, the most common complaints in patients with a positive PCR test were a fever, cough, shortness of breath, fatigue, and a sore throat. Diarrhea was not a significant variable in terms of the COVID-19 diagnosis. Our findings were consistent with other studies in the literature.

For emergency health services to perform effectively, it is necessary to determine the density of hospitals and to transfer patients to hospitals accordingly. Accurate pre-hospital triage is critical to ensure the proper allocation of resources and care.^[13,14] In a study of 44,415 patients in China, it was reported that 81% of the patients experienced a mild course of COVID-19, 14% a severe course, and 5% a critical course.^[15] The triage codes of the patients in our study were 57.1% yellow, 37.1% green and 5.7% red, which was consistent with the literature.

Epidemiological studies of COVID-19 have found that the disease is more common in urban areas.^[16,17] Individuals in urban areas are generally more at risk for COVID-19 than residents of rural areas due to the ease of airborne transmission in densely populated environments. Similarly, in our study, 95.7% of the positive cases were from urban locations.

As a retrospective and single-center study, this research is limited. Confirmation of our study data with prospective cohorts is needed.

CONCLUSION

SARS-CoV-2 infection spread rapidly and led to a COVID-19 pandemic. The alarming growth in case numbers and the high morbidity rate caused widespread anxiety and a significant strain on resources and systems around the world. The duration, magnitude, and impact of the pandemic remains uncertain. Descriptive data, such as age and gender distributions, sociocultural details, and symptoms help to determine which populations are most at risk. This information can provide guidance on measures can be taken to achieve control of the disease.

Ethics Committee Approval

Approval for this study was granted by University of Health Sciences Dr. Abdurrahman Yurtaslan Oncology Health Practice and Research Center Clinical Research Ethics Committee May 20, 2020 (no: 2020/5/607).

Informed Consent

Retrospective study.

Peer-review

Internally peer-reviewed.

Authorship Contributions

Concept: A.U.S.; Design: A.U.S.; Supervision: A.U.S.; Fundings: A.U.S.; Materials: A.U.S.; Data: E.U.; Analysis: E.U.; Literature search: E.U.; Writing: E.U.; Critical revision: E.U.

Conflict of Interest

None declared.

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112 Acil Sağlık Hizmetleri Ambulanları ile Taşınan COVID-19 Olası ve Kesin Tanılı Hastaların Demografik Özelliklerinin İncelenmesi

Amaç: Bu çalışmadaki amacımız 112 acil sağlık hizmetlerine bağlı ambulanslar ile taşınan olası ve kesin tanıli koronavirüs hastalığı 2019 (COVID-19) hastalarının demografik özelliklerinin incelenmesidir.

Gereç ve Yöntem: Bu çalışma geriye dönük olarak COVID-19 tanısı veya şüphesi olup ambulans ile nakli sağlanmış hastaların verileri kullanılarak oluşturuldu. 11 Mart 2020–11 Mayıs 2020 tarihleri arasında Ankara 112 acil çağrı merkezine ulaşan tüm çağrılar incelendi, 18 yaş üstü, ambulans ile taşınan tüm olgular çalışmaya alındı.

Bulgular: Acil çağrı merkezinde sağlık ekibi tarafından yapılan değerlendirme sonucu 107.173 olguya ambulans görevlendirmesi yapılmıştı. 11.345 tane olası COVID-19 ön tanıli olgunun hastanelere transferi sağlandı. Bu hastaların 856'sı (%7.5) PCR sonucuna göre COVID-19 kesin tanısı aldı. COVID-19 tanısı alan hastaların %50.6'sı kadını ve yaş ortalaması 50.6 ± 18.7 idi. COVID-19 pozitif hastaların triaj kodları %57.1 sarı, %37.1 yeşil ve %5.7 kırmızı olarak değerlendirildi. COVID-19 pozitif hastaların %95.7'si kentsel olguydu.

Sonuç: COVID-19'a bağlı enfeksiyonlar dünyaya hızla yayılarak pandemiye yol açmıştır. Hızla artan olgu sayıları ve virüsün yüksek morbidite oranı toplumda yaygın kaygı durumuna neden olmuştur. Olguların yaş ve cinsiyet dağılımları, sosyokültürel durumları ve semptomları gibi tanımlayıcı veriler hastalığın hangi popülasyonlarda daha sık görüldüğü ve risk gruplarını belirlemede faydalı olacaktır.

Anahtar Sözcükler: Acil sağlık hizmetleri; COVID-19; epidemiyoloji; koronavirüs; pandemi.