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Evaluation of the COVID-19 Triage Results in an Education Family Practice Center

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ABSTRACT

Objectives: This study aimed to evaluate the COVID-19 triage results of the admissions made by patients in a certain region to the Education Family Practice Center (E-FPC) during the pandemic period.

Methods: Patients aged 18 years and above, who were applied to the E-FPC between March 12 and April 30, 2020, were included in the study. Every patient had filled in a triage form. Potential cases were referred to a high-level healthcare center. Polymerase chain reaction (PCR) and chest computed tomography (CT) results of the referred patients were followed up and noted.

Results: Four hundred sixty-one patients were included in the study. Twenty-seven (5.9%) patients had a fever, 219 (47.5%) patients had a cough, 34 (7.4%) patients had dyspnea, and 305 (66.2%) patients had other symptoms. Eighty-six (18.6%) of the patients were admitted to the hospital for PCR test of which 15 (17.4%) had a positive test result. Seventy-one (15.4%) patients underwent a chest CT and 25 (35.2%) of them had results compatible with COVID-19. Fever was detected in 8 (53.3%) of the patients with a positive PCR result and in 6 (8.5%) patients with a negative PCR result ($p<0.001$). Dyspnea was detected in 13 (52.0%) patients whose chest CT results were compatible with COVID-19 and in 5 (10.9%) patients whose chest CT results were not compatible with COVID-19 ($p<0.001$).

Conclusion: Symptoms, CT imaging, and PCR results should be evaluated together in the diagnosis of COVID-19. Triage practices should be maintained in primary healthcare centers throughout the pandemic.

Keywords: COVID-19, primary healthcare, triage

INTRODUCTION

COVID-19 is the name of the infectious disease caused by a new type of coronavirus (2019-nCoV), which was detected in humans after an unusual increase of pneumonia cases in the city of Wuhan, China, on December 31, 2019.[1] In Turkey, the first cases were discovered after March 11, 2020. After the COVID-19 cases were seen, same as in most other countries in the world, many measures, regulations, and procedures were implemented to prevent the spread

of the disease and to allow early diagnosis and treatment.[2] Defining university hospitals and educational and research hospitals as pandemic hospitals, converting many of the inpatient services to pandemic services, postponing non-urgent operations, suspending outpatient clinic practices for a while, and changing triage practices are some of these regulations.[3]

Triage is a word of French origin and means "to distinguish." Nowadays, it is used to sort the patients according to their urgency.[4] Patients who admit to primary care centers are recommended to wait with at least 1 m distance from one another outside the building during triage, and their body temperature should be measured using an infrared thermometer after the triage questions are asked. People who are found to be at risk for COVID-19 during the triage are evaluated in the examination area reserved for COVID-19, and possible cases are referred to higher centers according to the determined procedures.[5] Education Family Practice Center (E-FPC) are the clinics where all the services are provided to the society by assistant physicians under the supervision and coordination of a trainer, and these clinics work under a family medicine clinic. These clinics serve both the healthy people for routine follow-ups and vaccination and the patients with complaints.[6]

These institutions served as the first contact point during the pandemic period, and therefore, triage practice has been started in E-FPC to minimize the contact of healthy individuals with risky individuals and also to refer the high-risk patients to high-level healthcare centers.

In this study, it was aimed to evaluate the relationship between the symptoms of patients who underwent triage in primary care centers and the outcomes of further examinations.

METHOD

This study was a single-center study carried out with a screening of patients who applied to the University of Health Sciences Sisli Hamidiye Etfal Health Practice and Research Center E-FPC outpatient clinic with different complaints between March 12 and April 30, 2020. Due to the different progress of COVID-19 in patients above and below 18 years of age, only patients aged 18 and above were included in the study.[7] Patients who were admitted to E-FPC and evaluated as possible COVID-19 cases and referred to the upper-level healthcare centers were included in the study. The triage form was prepared according to the possible case definition of the Ministry of Health, General Directorate of Public Health, COVID-19 guide, dated March 11, 2020.[8] The patients were inquired about symptoms (fever, cough, dyspnea, and others), contact with COVID-19 positive individuals, travel history abroad, and contact history with someone traveling abroad in the last 14 days. People with positive findings in their triage form were evaluated as possible cases and referred to a higher level of healthcare service. Polymerase chain reaction (PCR) and chest computed tomography (CT) results of these patients were noted.

The total number of patients applied to E-FPCs was 9243. Of these patients, 673 (7.2%) of them were referred to a higher-level healthcare center due to their answers on the triage form, and 461 (5.0%) people were included in the study. Admission to the E-FPC and triage is shown in Figure 1.

The data were processed in the Statistical Package for the Social Sciences (SPSS) 21 software. Descriptive statistics were evaluated as frequency and percentage for categorical variables and median, minimum, and maximum for numerical variables. The Chi-squared test and Fisher's exact test were used for categorical variables. The Mann–Whitney U test was used for numerical variables nonnormally distributed. A p-value of <0.05 was considered significant.

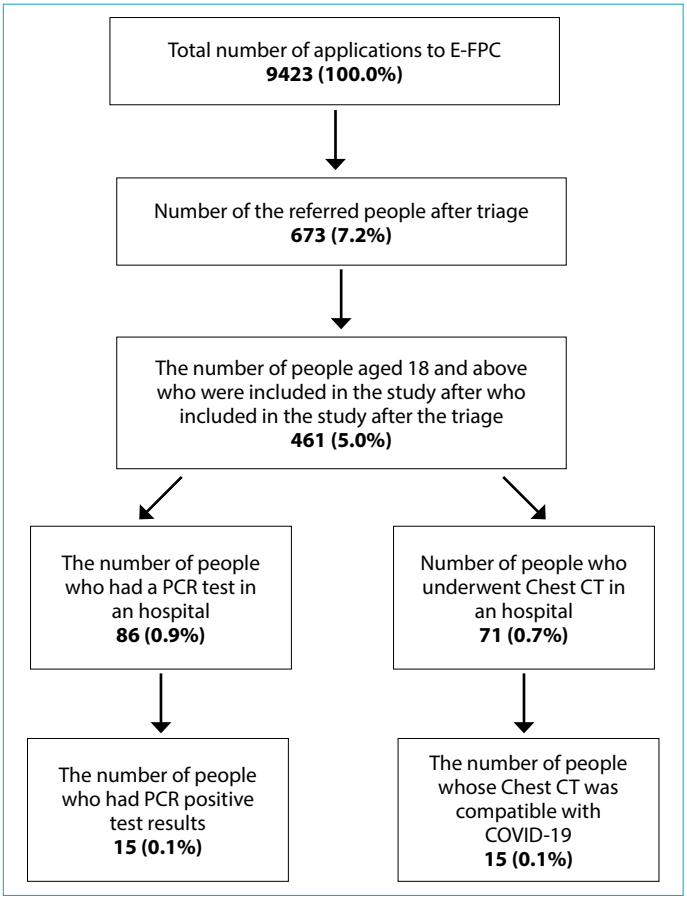

Figure 1. Admission to the Education Family Practice Center and triage.

RESULTS

Four hundred sixty-one patients were included in the study. The mean age was 45.0 (18.0–84.0) years and 254 (55.1%) of them were females. Twenty-seven (5.9%) patients had a fever, 219 (47.5%) patients had a cough, 34 (7.4%) patients had dyspnea, and 305 (66.2%) patients had other symptoms (headache, new loss of taste or smell, and sore throat). One hundred ninety-two (92.8%) of the men and 242 (95.3%) of the women had complaints of fever (p=0.251). One hundred ten (53.1%) of the men and 132 (52.0%) of the women had complaints of cough (p=0.802). One hundred ninety-three (93.2%) of the men and 234 (92.1%) of the women had complaints of dyspnea (p=0.650).

When the relationship between the age and the symptoms was evaluated, it was found that the median age of patients with fever was 43.0 (20.0–67.0) years, while the median age of patients without fever was 45.0 (18.0–84.0) years (p=0.201). The median age of patients with dyspnea was 45.5 (19.0–76.0) years, while the median age of patients without dyspnea was 45.0 (18.0–84.0) years (p=0.428). The median age of patients with cough was 46.0 (18.0– 84.0) years, while the median age of patients without cough was 42.0 (18.0–76.0) years (p<0.001).

Ten (2.2%) of the participants traveled abroad in the last 14 days, and 39 (8.5%) of the participants had contact with a possible COVID-19 case or a person coming from abroad.

Four hundred sixty-one patients were evaluated as potential cases after triage. Of these 461 patients, 375 (81.3%) of them did not have PCR test after being referred to the pandemic hospitals, 86 (18.6%) of them had a PCR test, and 15 (17.4%) of them were positive. Seventy-one (15.4%) patients underwent a chest CT and 25 (35.2%) of them were compatible with COVID-19.

The median age of PCR-positive patients was 47.0 (20.0–67.0) years, while the median age of PCR-negative patients was 44.0 (19.0–79.0) years (p=0.869). The gender and complaints of the participants according to the PCR results are summarized in Table 1.

Frequencies of fever and dyspnea were significantly higher in patients whose chest CT results were compatible with COVID-19 (p=0.011 and p<0.001, respectively). The gender and complaints of the participants according to the chest CT scan results are summarized in Table 2.

DISCUSSION

While providing diagnosis and treatment services to people with the disease, E-FPC, one of the primary healthcare services, also provides preventive healthcare to healthy people.

Table 1. Gender and complaints of the participants according to the PCR results

	PCR negative (n=71)	PCR positive (n=15)	p
Gender			
Female	42 (59.2)	3 (20.0)	0.006*
Male	29 (40.8)	12 (80.0)	
Cough			
Present	42 (59.2)	14 (93.3)	0.012*
Absent	29 (40.8)	1 (6.7)	
Fever			
Present	6 (8.5)	8 (53.3)	<0.001†
Absent	65 (91.5)	7 (46.7)	
Dyspnea			
Present	16 (22.5)	3 (20.0)	1.000†
Absent	55 (77.5)	12 (80.0)	

PCR: Polymerase chain reaction
Data are presented as n (%).
*Chi-squared test, †Fisher'sexact test

[4] Due to these features, a triage system was used to separate the healthy people from the people with symptoms and diseases in the pandemic period. To the best of our knowledge, this is the first study in Turkey that gives the results of the triage system of the primary healthcare centers.

Table 2. Gender and complaints of the participants according to the chest CT scan results

	Chest CT scan results inconsistent with COVID-19 (n= 46)	Chest CT scan results compatible with COVID-19 (n=25)	p
Gender			
Female	28 (60.9)	13 (52.0)	0.470
Male	18 (39.1)	12 (48.0)	
Fever			
Present	5 (10.9)	9 (36.0)	0.011
Absent	41 (89.1)	16 (64.0)	
Cough			
Present	36 (78.3)	18 (72.0)	0.555
Absent	10 (21.7)	7 (28.0)	
Dyspnea			
Present	5 (10.9)	13 (52.0)	<0.001
Absent	41 (89.1)	12 (48.0)	
PCR			
Positive	8 (17.4)	7 (72.0)	0.296
Negative	38 (82.6)	18 (28.0)	

CT: Computed tomography; PCR: Polymerase chain reaction
Data are presented as n (%).
Chi-squared test.

In the study, it was seen that most of the patients, who were referred to the high-level healthcare center for further examination and treatment due to the suspicion of COVID-19, did not go to these centers. The reasons why these people did not admit to the high-level healthcare center might be that they do not think they are COVID-19 patients, they do not have enough information about the disease, or they avoid higher-level healthcare facilities because of the fear of the transmission of the disease.

In the study, it is seen that the majority of patients diagnosed with COVID-19 were male patients. In a meta-analysis including 1994 patients, 60% of COVID-19 patients were men, and the median age ranged from 36 to 59 years.[9] Again, many studies showed that the male gender is a poor prognostic for COVID-19.[10,11] This may be due to some genetic or hormonal differences. The higher occurrence of chronic diseases in men may be another reason.[11]

In terms of symptoms, it is seen that the most common is a cough, and the incidence of cough increases with age. As in all age groups, coughing is one of the most common symptoms in the old age group.[12] The coughing reflex does not lessen with natural aging; it lessens in pathological conditions of the central nervous system such as stroke. [13] Coughing can be a sign of COVID-19 in elderly people, and in this study, cough as a symptom was found significant for PCR positivity.

Fever and dyspnea were found as significant symptoms for chest CT positivity. When the COVID-19-related symptoms are assessed in the literature, it is seen that the symptoms change according to the severity of the disease. In mild cases, symptoms such as dry cough, low-grade fever, nasal congestion, sore throat, and myalgia might resemble upper respiratory tract infections. The absence of dyspnea, hypoxemia, and absence of radiographic features are also characterized by mild disease. Approximately, 80.0% of PCR positive patients have mild symptoms.[14,15] Cough, dyspnea, and tachycardia may be seen in moderate cases, while severe cases may have a high-grade fever, severe dyspnea, and tachypnea. Along with these findings, lesions such as ground-glass opacities, consolidation, air bronchogram, and crazy paving pattern are detected in radiologic tests of patients.[14,16]

According to the examination results of the patients, it is seen that the positivity detection rate of chest CT is approximately two times higher than that of the PCR test. Chest CT has a high sensitivity for the diagnosis of COVID-19.[17] In 60.0%–93.0% of COVID-19 cases, chest CT is determined to be compatible with the disease before or simultaneously with PCR positivity. For this reason, many studies suggested that chest CT can be used for screening in clinically compatible COVID-19 cases even if the PCR test is negative.[18]

In this study, one-fifth of the patients who were referred to high-level healthcare facilities for further examination had a PCR test and were diagnosed with COVID-19, whereas one-third of them underwent chest CT and were diagnosed with COVID-19. It was determined that assessing the symptoms, imaging, and PCR results together increased the possibility of the diagnosis. These findings were consistent with the literature.[19,20]

COVID-19 creates a risk for sick people as well as those who come to the primary healthcare service for routine follow-up and examinations. The reason for this risk is the high level of contagiousness of the disease and the higher mortality of the disease in people with chronic diseases and older ages.[10] Triage is a method that is frequently used in emergency services to determine the priority of the disease and to use available medical resources appropriately.[21] Triage can also be applied as a method to reduce the contact between healthy individuals and individuals diagnosed with COVID-19 in primary care.

Including patients from only one E-FPC region and having a small sample size were the limitations of the study. However, it is thought that from the first period of the pandemic until today, all number of admissions made to primary care centers, further examinations of the people who were referred to a high-level healthcare center, and follow up of their COVID-19 status will contribute to a better understanding of the continuity of the process and the importance of the primary care centers during the pandemic period.

CONCLUSION

In this study, the prevalence of fever and cough complaints was found to be higher in patients with PCR positive test. The prevalence of fever and dyspnea was also found to be higher in patients whose chest CT was compatible with COVID-19. Triage practice can be used as a method, to ensure that possible cases are referred to higher-level healthcare services. Therefore, there will be no delay in diagnosis and treatment and reduce the contact between healthy individuals and positive individuals in primary healthcare services.

Disclosures

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