Temporal and clinical distribution of 112 emergency call system use of geriatric patients during novel coronavirus pandemic process

Sukru Yorulmaz¹, Figen Tunali Turkdogan², Abdullah Emre Guner³, Kenan Ahmet Turkdogan⁴

¹Ministry of Health General Directorate of Emergency Health Service, Ankara, Turkey
²Istanbul Physical Therapy and Rehabilitation Training and Research Hospital, Istanbul, Turkey
³University of Health Sciences, Department of Public Health, Istanbul, Turkey
⁴Cam and Sakura Training and Research Hospital, Department of Emergency Medicine, Istanbul, Turkey

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Abstract

112 emergency call system is crucial for geriatric patients because the safe and secure transport of these patients can decrease mortality and morbidity. The present study was a temporal and clinical evaluation of cases with COVID-19 and non-COVID-19 older than 65 years of age during the pandemic. Of the 10948 cases accepted diagnosed with novel coronavirus between March 11 and May 1, 2020, 51.6% (n=5650) were female, 48.4% (n=5298) were male and the median age was 75.0 (70.0-81.0) years. The patients were compared concerning age, gender, month distribution, symptoms, comorbidity, computed tomography results, hospitalization, and discharge criteria. Concerning symptoms, the findings showed that 50.0% (n=5476) had high fever, 50.3% (n=5504) had cough, 59.5% (n=6509) had shortness of breath. Atypical complaints were found in 21.3% (n=2337) of the patients. Concerning comorbidity, 10.3% (n=1126) had hypertension, 5.8% (n=633) had diabetes mellitus, 7.2% (n=784) had chronic obstructive pulmonary disease and 0.9% (n=95) had cerebrovascular disease. The findings showed that 26.0% of the cases were hospitalized, while 74.0% (n=8098) were discharged. In 112 call center calls, being more careful and alert in the anamnesis of the geriatric patient group defined as important concerning the atypical course and potential risk factors and in the use of protective equipment is important for safe and secure transport of patients and since this will decrease mortality and morbidity.

Keywords: COVID-19, hospitalization and discharge, 112 health services, geriatric

Introduction

SARS-CoV-2 infection of the Coronavirus family first appeared in Wuhan City, China, in December 2019. The SARS-CoV-2 infection starts with mild symptoms, such as high fever, cough, and difficulty breathing, in the patients and causes the development of pneumonia [1]. It causes respiratory failure and hepatic, gastrointestinal, and neurological complications in severe cases and it may result in death. Symptoms generally appear 2-14 days after catching the virus. Bacterial co-infection, smoking history and chronic diseases, such as hypertension, diabetes, and asthma, and age group over 60 years of age, are risk factors for poor prognosis and mortality [2].

COVID-19 can be transmitted from person to person using droplet or contact [3]. Studies for protection or prevention from the disease have concentrated on populations that are susceptible to the disease, including children, health service workers, and the elderly [4].

Currently, there is no specific treatment for COVID-19 that has been proven to be safe and effective. Although antivirals have been reported to be more rational to use within the framework of randomized controlled studies, antivirals with little evidence that they may be effective are commonly used for the treatment of these patients in the whole world due to the urgency of the current situation. The combined use of possible treatment options in patients with COVID-19 should be considered based on patients and by evaluating all existing literature and care should be taken for their undesired effects [5].

In this study, we wanted to share the details of 112 call system use of geriatric patients since the incidence of chronic diseases...
is higher in individuals aged 65 and older and since they may be affected by the severity of the epidemic more.

**Materials and Methods**

In this study, incoming geriatric patients’ calls to Anatolia and Europe 112 emergency call centers in the metropolitan city of Istanbul between March 11 and May 1 were analyzed retrospectively. Approval was obtained from the Ministry of Health and the local ethics committee (15/05/2020-2020.05.1.19.051) for the study.

112 Emergency Call Center data of the calls were analyzed and the data were reviewed retrospectively. The cases were followed to find out the contact. Fever, cough, and shortness of breath complaints of the cases and comorbid diseases, malignity, and thorax tomography results were noted. The anamnesis included the question of whether there was a COVID-19 case at home, and if there was, the presence of travel abroad was questioned.

To calculate the status of the COVID-19 pandemic, geriatric patients’ 112 calls, the calls corresponding to the same period in 2018 and 2019 were calculated and the year 2020 was calculated in the increase rate as simulation. Later, the present 2020 and simulated 2020 were compared.

**Statistical analysis**

The data obtained from this study were analyzed with SPSS 20 (SPSS Inc., Chicago, IL, USA) package program. Categorical measurements were recorded as numbers and percentages, while continuous measurements were recorded as mean and standard deviation. The Chi-Square test was used in the analysis of categorical variables.

**Results**

Of the 10948 cases included in this study, 51.6% (n=5650) were female, while 48.4% (n=5298) were male and the median age of the cases was 75.0 (70.0-81.0) years. 0.3% (n=34) of these cases were foreign. Concerning the distribution of the cases by months, it was found that 21.6% (n=2361) of the cases applied in March, while 78.4% (n=8587) applied in April. Concerning the distribution of types of cases, 82.1% (n=8986) were emergency service patients, while 17.9% (n=1962) were referral patients. When it was examined to which the hospitals the cases were referred to, 85.4% (n=9348) was not positive. 9.35 (n=1020) of the cases had normal findings and in 0.9% (n=99) the diagnosis was not clear concerning pneumonia. Concerning the distribution of diagnosis, while 14.6% (n=1600) of the cases were COVID-19 positive, 85.4% (n=9348) was not positive. 9.35 (n=1020) of the cases had at least one COVID-19 positive sample. It was found that 26.0% of the cases were hospitalized, while 74.0% (n=8098) was discharged.

Table 1 shows the distribution of these cases by months (March 2020-April 2020) and significance levels.


**Table 1. Distribution rates and significance levels of data by months**

<table>
<thead>
<tr>
<th>Category</th>
<th>March 2020, % (n)</th>
<th>April 2020, % (n)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, Fever</td>
<td>48.0 (1133)</td>
<td>52.6 (4517)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government State Hospital</td>
<td>85.8 (2026)</td>
<td>78.2 (6718)</td>
<td></td>
</tr>
<tr>
<td>Government University</td>
<td>1.7 (41)</td>
<td>2.7 (230)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Private Hospital</td>
<td>12.5 (294)</td>
<td>19.1 (1639)</td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>51.7 (1220)</td>
<td>49.6 (4256)</td>
<td>0.069</td>
</tr>
<tr>
<td>Cough</td>
<td>51.7 (1220)</td>
<td>49.9 (4284)</td>
<td>0.125</td>
</tr>
<tr>
<td>Disnea</td>
<td>54.3 (1282)</td>
<td>60.9 (5227)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Thorax Tomography</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viral Pneumonia</td>
<td>64.3 (81)</td>
<td>77.8 (1100)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Normaly</td>
<td>30.2 (38)</td>
<td>15.7 (222)</td>
<td></td>
</tr>
<tr>
<td>Mix</td>
<td>5.6 (7)</td>
<td>6.5 (92)</td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient</td>
<td>6.4 (151)</td>
<td>16.9 (1449)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Not-Patient</td>
<td>93.6 (2210)</td>
<td>83.1 (7138)</td>
<td></td>
</tr>
<tr>
<td>Sample</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>30.5 (123)</td>
<td>36.7 (897)</td>
<td>0.017</td>
</tr>
<tr>
<td>Negative</td>
<td>69.5 (280)</td>
<td>63.3 (1550)</td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalization</td>
<td>17.1 (403)</td>
<td>28.5 (2447)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Externe</td>
<td>82.9 (1958)</td>
<td>71.5 (6140)</td>
<td></td>
</tr>
<tr>
<td>Atypical Complaint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>29.0 (685)</td>
<td>19.2 (1652)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Negative</td>
<td>71.0 (1676)</td>
<td>80.8 (6935)</td>
<td></td>
</tr>
</tbody>
</table>

According to 2020 simulation call numbers created by calculating the increase between 2018 and 2019, a significant increase was found in 2020 COVID-19 and non-COVID-19 geriatric call numbers. While non-COVID-19 calls constituted these COVID-19 and non-COVID-19 calls until March 24, non-COVID call rates decreased after March 30. Instead, COVID-19 calls began to increase (Figures 1).
patients were taken to emergency services, while 17.9% were referred to state hospitals. In the general distribution of patients diagnosed with COVID-19 in the whole of Turkey, the findings showed that 4308 of 155862 cases died. In monthly data, the lowest number of cases and deaths were in March with 13531 cases and 214 deaths, while the highest number of cases and deaths were in April with 106673 cases and 2960 deaths, and in May, the number of cases and deaths was 35482 cases and 1134 deaths [13]. The most common symptoms were high fever, cough, and shortness of breath in cases with COVID-19. 50.0% of cases had a high fever, 50.3% had a cough, and 59.5% had shortness of breath. Apart from these complaints, atypical complaints, such as loss of taste and odor, nausea and diarrhea, headache, rhinorrhea, and urticarial skin findings, were seen in 21.3% of the cases. While asymptomatic infection courses in a spectrum between mild course clinics and critical diseases, most of the infections are not severe. In a study that evaluated the disease severity of approximately 44.500 positive cases from the Chinese Disease Control and Prevention Centre, a mild course clinic was reported in 81% of the cases, while a severe disease was reported in 14% and critical disease was reported in 5% [14].

For people, COVID-19 is considered a serious global threat that can quickly turn into a pandemic [6]. When compared with other coronaviruses, it has a high risk of transmission [7]. Individuals with advanced age and chronic disease are the two groups with the highest risk in the COVID-19 pandemic, which has affected thousands of people. It has been shown that the most important risk factor in COVID-19 deaths is individuals with chronic disease [8]. It has been seen that COVID-19 patients with underlying chronic obstructive pulmonary disease, asthma, heart failure, and other chronic diseases require emergency intervention and hospitalization in intensive care units [9].

In the present study, 51.6% of the patients older than 65 years of age were female, while 48.4% were male and the average age was 75 years. 0.3% of the cases were foreign. When age groups were examined in similar studies, the average age was lower. These studies have shown that while the COVID-19 epidemic affects all ages, it causes more severe in the older age group (50 and older) and it has been emphasized that individuals with chronic diseases are more severely affected by the epidemic. In their study, Xu et al. collected clinical data from 62 patients with a laboratory-approved SARS-COV-2 infection. The average age was calculated as 41 and 58% of the patients were male [10]. In their study conducted with 51 patients with a confirmed diagnosis between the ages of 16 and 76, the average disease age was 49. 22% of the patients had comorbidities, such as diabetes, hypertension, chronic liver disease, chronic obstructive pulmonary disease, and cardiac disease [11]. Qin et al. reported the average disease age as 58 in 286 of 452 patients with COVID-19. When compared with patients who did not have a severe infection, age was more advanced in patients with severe infection. While patients with severe infection constituted the 51-69 age group, the average age was 61 and 44% of the patients had chronic disease and infection had a more severe course [12].

In this study, the findings showed that 21.6% of the cases applied in March, while 78.4% applied in April. While 82.1% of the patients were taken to emergency service, 17.9% were referred to advanced centers. It was found that 79.9% of the referred patients were referred to state hospitals, while 2.5% were referred to state universities and 17.7% were referred to private hospitals. In the general distribution of patients diagnosed with COVID-19 in the whole of Turkey, the findings showed that 4308 of 155862 cases died. In monthly data, the lowest number of cases and deaths were in March with 13531 cases and 214 deaths, while the highest number of cases and deaths were in April with 106673 cases and 2960 deaths, and in May, the number of cases and deaths was 35482 cases and 1134 deaths [13]. The most common symptoms were high fever, cough, and shortness of breath in cases with COVID-19. 50.0% of cases had a high fever, 50.3% had a cough, and 59.5% had shortness of breath. Apart from these complaints, atypical complaints, such as loss of taste and odor, nausea and diarrhea, headache, rhinorrhea, and urticarial skin findings, were seen in 21.3% of the cases. While asymptomatic infection courses in a spectrum between mild course clinics and critical diseases, most of the infections are not severe. In a study that evaluated the disease severity of approximately 44.500 positive cases from the Chinese Disease Control and Prevention Centre, a mild course clinic was reported in 81% of the cases, while a severe disease was reported in 14% and critical disease was reported in 5% [14].

First of all, fever, cough, shortness of breath, and pneumonia pictures characterized by bilateral infiltrates are the most common severe symptoms of COVID-19. There is no specific clinical characteristic that distinguishes COVID-19 safely from other viral respiratory tract infections. In a similar study which examined 138 patients hospitalized with COVID-19 pneumonia in Wuhan, the most common clinical characteristics in the onset of the diseases were reported as fever 99%, fatigue 70%, cough 59%, anorexia 40%, myalgia 35%, dyspnoea 31%, and phlegm 27% [15]. Other cohort studies conducted with COVID-19 confirmed that patients from Wuhan reported a similar series of clinical findings. However, fever may not be a universal finding. In one study, fever was reported in almost all patients; however, approximately 20% of the cases were reported to have low fever <38°C. In another study conducted on 1099 patients coming from Wuhan and other areas in China, it was reported that fever (axillary temperature measured higher than 37.5°C) was seen in only 44% of the patients at admission; however, it was found with a rate of 89% during hospitalization [16].

Severe disease may occur in healthy individuals of any age; however, a severe disease picture is predominantly seen in individuals with advanced age or underlying comorbidity. The active or previous malignancy rate of the individuals was reported as 3.2%. Concerning comorbidity, 10.3% of the cases had hypertension, 5.8% had diabetes mellitus, 7.2% had a chronic obstructive pulmonary disease, 0.9% had cerebrovascular diseases and 23.5% of the cases were being followed. 10.3% of the cases had a history of contact with an individual diagnosed with COVID-19. In similar studies, cardiovascular disease, diabetes mellitus, hypertension, chronic pulmonary disease, cancer, chronic renal disease, and obesity (body mass index ≥30) were associated with severe disease and mortality [17,18]. In addition to these comorbidities, United States Disease Control and Prevention Center accept immunodeficiency, severe obesity (body mass index ≥40), and liver disease as a potential risk factor for serious/severe COVID-19, although specific data about their risks are limited.
COVID-19 frequently courses severely in patients with advanced age and comorbidity. In the SARS-CoV-2 epidemic in a long-term senior care facility in America, the average age of the affected 101 cases was 83 and 94% had an underlying chronic disease. In these cases, hospitalization and mortality rates were reported as 55% and 34%, respectively [20].

One thousand five hundred forty cases had thoracic CT in this study. 76.7% (n=1181) of these were compatible with viral pneumonia, 16.9% (n=260) showed normal findings and in 0.9% (n=99) the diagnosis was not clear concerning pneumonia. While 14.6% of the patients were COVID-19 positive, 85.4% were negative. 9.3% of the cases had at least one positive finding concerning infection. However, diagnostic tests are needed since all symptoms are not specific for the disease and the disease may progress to severe pneumonia quickly [21]. In COVID-19 diagnosis, although the “real-time reverse transcription-polymerase chain reaction” (RT-PCR) test made for viral nucleic acids is the gold standard, thoracic CT has gradually become more important in diagnosis since it may give incorrect negative results [22]. The sensitivity of CT has been shown to reach 98% in studies conducted [23].

Hospitalization indications in patients with COVID-19: possible and/or positive cases are isolated and treated in Pandemic Hospitals (hospitals of the Ministry of Health, State and Foundation University Hospitals, and private hospitals). Following the assessment of the physician, the cases are treated and followed in Pandemic Hospitals or their houses. In parallel with the Pandemic Plan for cities and hospitals, positive and possible cases must be first of all followed in hospitals, services, and intensive cases reserved for these patients. The patients should be followed in an isolated way if possible and if not in areas separated with a distance of at least 1-1.5 meters. In places where there are no pandemic hospitals, hospitals which have secondary care adult intensive care unit serve as a pandemic hospital [11]. Criteria for discharge: normal body temperature at least three days (temperature taken from the ear should be less than 37.5°C). Respiratory system symptoms should be significantly improved. Two consecutive tests for nucleic acid test respiratory tract pathogen should be negative (sampling interval should be more than 24 hours); if a possible nucleic acid test can be conducted in stool samples, Lesions in lung images should have obvious improvement. There should be no comorbidity or complication that requires hospitalization. SaO2 should be >93% without oxygen support. Discharge should be approved by a multidisciplinary medical team.45 While 26.0% of the patients were hospitalized, 74.0% were discharged.

Conclusion

COVID-19 pandemic leads to destructive pictures with an increasing number of cases and deaths. Protecting from this epidemic, which does not have a treatment yet, is vitally important. Because the incidence of chronic diseases is higher in individuals aged 65 and older and they are more affected by the epidemic, being more careful and alert in detailed anamnesis and concerning protective equipment while being evaluated by 112 system and being guided to the ambulance is important since this will highly likely to decrease mortality and morbidity.

Conflict of interests
The authors declare that they have no competing interests.

Financial Disclosure
All authors declare no financial support.

Ethical approval
Approval was obtained from the Ministry of Health and the local ethics committee (15/05/2020 - 2020.05.1.19.051) for the study.

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