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Evaluation of Patients Presenting to the Emergency Department in terms of Sociodemographic Characteristics, Diagnosis Codes and COVID-19 Diagnosis

Acil Servise Başvuran Hastaların Sosyodemografik Özellikler, Tanı Kodları ve COVID-19 Tanısı Açısından Değerlendirilmesi

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ÖZ

Amaç: Acil serviste COVID-19 tanısı alan hastaların sosyodemografik özellikleri ve tanı kodları açısından değerlendirilerek COVID-19 pandemisinin acil servis başvurularına ve işleyişine olan etkisini incelemek amaçlandı.
Araçlar ve Yöntem: Retrospektif, tanımlayıcı tipte olan bu çalışma, 1100 yataklı bir hastanenin acil servisinde 11.03.2020-31.03.2021 tarihleri arasında yapıldı.
Bulgular: Acil servis başvuruların yıl içerisindeki dağılımına göre; pandemi polikliniğine kabul edilen hasta sayıları haziran ayında en düşük seviyede, kasım ayında ise en yüksek seviyededir. Aylık başvuru sayılarının yaşa göre dağılımında en çok başvuru 15-29 yaş grubu ile 30-44 yaş gurubunda; en az başvuru ise 0-14 yaş gurubundadır. Hastanede yatarak tedavi edilen COVID-19 tanılı kişi sayıları nisan ve kasım aylarında en yüksek seyiyededir.Toplam başvuruya oranla test sonucu pozitif çıkma oranlarının en yüksek olduğu aylar; ekim (%15.3), ocak (%15.5) ve mart (%17.1) aylardır. Pozitiflik oranının cinsiyet bazlı dağılımında değerler genel olarak birbirine yakın olmakla birlikte 13 aylık ortalama değere bakıldığında kadınlarda ortalama değer %4.40, erkeklerde ortalama değer %4.45'tir.
Sonuç: Çalışmanın sağladığı veriler, COVID-19 pandemisinin acil servis başvurularına ve işleyişine olan etkisini göstermekle beraber; benzer durumlara yönelik olarak, gerekli eğitim, planlama ve organizasyon süreçlerine katkı sağlayacaktır.

Anahtar Kelimeler: acil servis; covid-19; retrospektif çalışma; tanı; triyaj

ABSTRACT

Purpose: This study was conducted to evaluate patients diagnosed with COVID-19 in the emergency department in terms of their sociodemographic characteristics and diagnosis codes and to examine the effect of the COVID-19 pandemic on presentations to the emergency department and its functioning.
Materials and Methods: This retrospective, descriptive study was conducted in the emergency department of an 1100-bed hospital between March 11, 2020 and March 31, 2021.
Results: According to the distribution of emergency service admissions during the year, the number of patients admitted to the pandemic outpatient clinic was the lowest in June and the highest in November. Considering the distribution of monthly presentation figures by age, the highest number of admissions were in the 15-29 and 30-44 age groups, and the least number of admissions was in the 0-14 age group. The number of patients diagnosed with COVID-19 was the highest in April and November. The months with the highest rate of positive test results compared to the total admissions were October (15.3%), January (15.5%), and March (17.1%). In the gender-based distribution of the COVID-19 positive cases, the values were generally close to each other; however, when the 13-month average was considered, it was found 4.40% in females and 4.45% in males.
Conclusion: Data provided by our study showed that the effect of the COVID-19 pandemic on emergency service admissions and functioning. Besides, they will contribute to the necessary education, planning, and organization processes for similar situations.

Keywords: covid-19; diagnosis; emergency department; retrospective study; triage

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INTRODUCTION

Emergency departments are units that provide uninterrupted health services and have been designed for the implementation of primary medical and surgical interventions required by individuals with health problems, such as accidents, trauma, and life-threatening diseases, which require rapid intervention.[1] Since emergency departments are the first application and intervention unit for many health problems, they are of great significance in terms of individual and public health and are like the showcase of the hospitals they are affiliated with.[2,3] It is very important to evaluate the number of presentations to the emergency department and the characteristics of the patients beforehand so that necessary planning and organization can be provided for the patient.[4]

In the new coronavirus (COVID-19) pandemic with high morbidity and mortality rates, emergency departments have been at the forefront of hospital and community care. They are of great significance in terms of both identifying and treating suspected COVID-19 cases and continuing to diagnose and treat other medical emergencies.[5,6,7,8] The most important issue in this process is the provision of high-quality and effective care. Therefore, it is of great significance to reorganize and restructure emergency departments to meet changing needs.[9,10,11,12]

In the light of this information, this study was conducted to evaluate patients who were diagnosed with COVID-19 in the emergency department in terms of their socio-demographic characteristics and diagnosis codes and to examine the effect of the COVID-19 pandemic on presentations to the emergency department and its functioning.

MATERIALS and METHODS

Design and Setting

In this retrospective, descriptive study, patients presenting to the emergency department of a 1100-bed hospital in a province in Türkiye between March 11, 2020 and March 31, 2021 were evaluated in terms of their sociodemographic characteristics, diagnosis codes, and COVID-19 diagnosis.

The data used in this study were obtained by retrospectively searching the hospital information management system (HIMS) records, which were anonymized by the IT department of the hospital where the research was conducted. First, the distribution of the number of emergency department admissions according to the adult emergency outpatient clinic and the pandemic outpatient clinic was determined. Afterward, the distribution of all patients admitted to both outpatient clinics according to triage codes, gender, age groups, and treatment type and the distribution of the individuals according to the services where they were admitted were examined. In addition, the diagnostic procedures of the patients admitted to the emergency department pandemic outpatient clinic, their distribution according to the diagnosis codes, the rates of starting antiviral drugs, and their distribution according to polymerase chain reaction (PCR) test results (negative or positive) were examined.

The diagnosis coding system of the International Classification of Diseases-10 (ICD-10) was used as the basis for determining the distribution according to the diagnosis codes, and the diagnoses were categorized according to the systems.

Analysis of Data

Data obtained from HIMS records were transferred to Microsoft Excel 2016 office software. Grouping of data, creation of charts, and calculation of mean and percentage distributions were performed on this software.

Ethical Dimension of Research

At the outset, the approval of Balıkesir University Faculty of Medicine Clinical Research Ethics Committee (decision no: 2021/126, date: 26.05.2021) was obtained for the study.

RESULTS

Considering the distribution of emergency service presentations throughout the year, the highest number of presentations in the adult emergency polyclinic in a ten-day period was in the last period of July 2020. The number of patients admitted to the pandemic outpatient clinic was the highest in the second period of November 2020 and the

lowest in the last period of June 2020 (Figure 1).

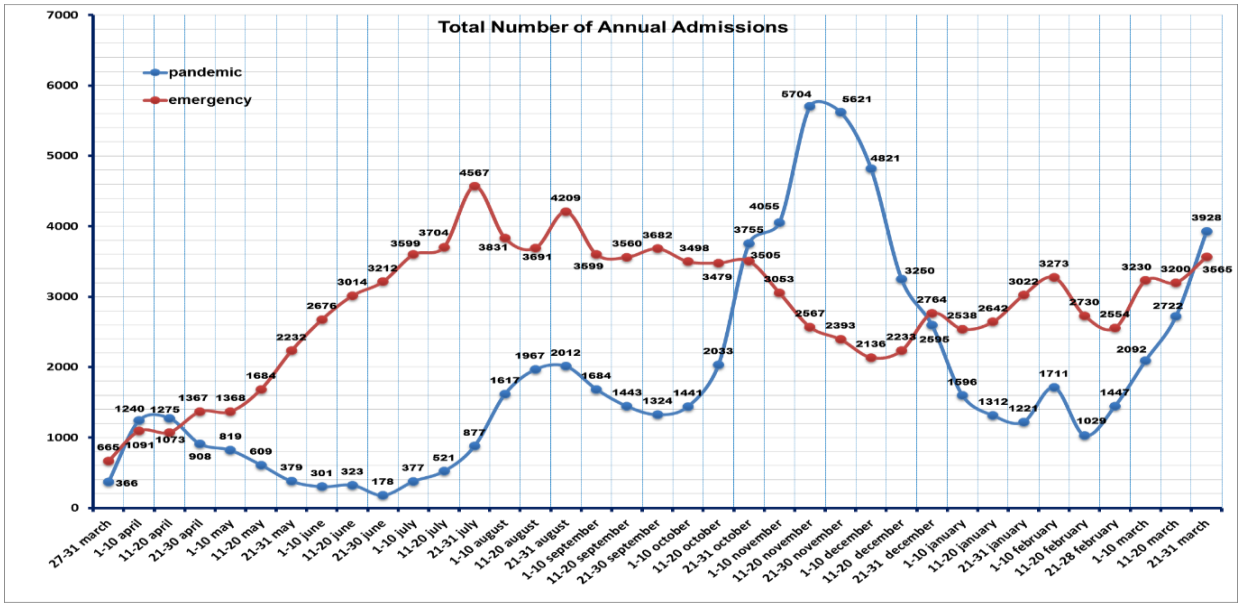

Figure 1. Annual distribution of the number of emergency service admissions in 10-day periods.

The examination of the distribution of emergency department admissions by gender indicated that the rates of male patient admissions were higher in both the pandemic outpatient clinic and the emergency outpatient clinic. It was seen that the majority of admissions in both polyclinics were in the yellow triage area. Presentation rates with the red triage code were higher in both outpatient clinics in March and April compared to other months (Supplement Table 1).

When the distribution of admissions to the pandemic outpatient clinic according to age groups was examined, it was determined that the highest number of admissions was in the 15-29 and 30-44 age groups, and the lowest number of admissions was in the 0-14 age group (Figure 2).

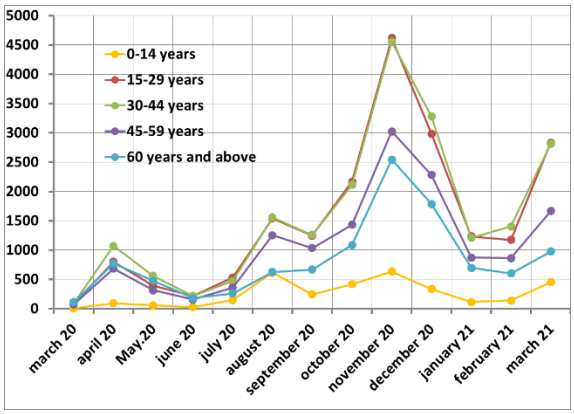

Figure 2. Distribution of emergency department pandemic outpatient clinic admissions by age groups.

It was observed that the rates of chest X-ray and thoracic computed tomography (CT) requests for diagnosis were high in the first months in the pandemic outpatient clinic (Supplement Table 2). The data of the number of people whose throat and nose swab samples were taken for diagnostic purposes in the first three months and a part of June could not be reached in the hospital database. Swab samples had been taken from all individuals admitted to the pandemic outpatient clinic in February 2021. The highest number of swab samples had been taken in November 2020. The rate of COVID-19 positive samples was the lowest in August 2020 and the highest in January 2021 and March 2021 (Supplement Table 2). Antiviral medication treatment as a result of examinations in the pandemic outpatient clinic was first initiated in May 2020.

The first data on PCR tests were available as of June. The highest rates of positive test results compared to the total admissions were observed in 2020 October, 2021 January, and 2021 March. Although the values for the gender-based distribution of positive test rates were generally close to each other, the 13-month average value was 4.40% for females and 4.45% for males (Figure 3).

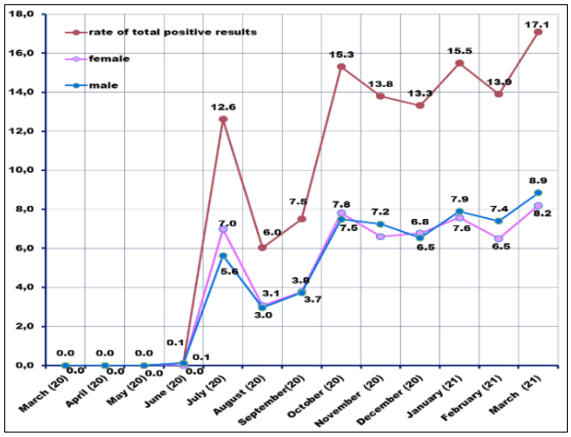

Figure 3. The rate of positive PCR test results of emergency service pandemic outpatient clinic admissions.

The highest number of patients who were deemed suitable for hospitalization after their presentation to the pandemic outpatient clinic was observed in November 2020 and December 2020. The highest rate of COVID intensive care admissions referred from the pandemic outpatient clinic was observed in March 2021. The highest number of patients admitted to the COVID service from the pandemic outpatient clinic was in April 2020 and November 2020.

The highest admission rates from the emergency outpatient clinic to the COVID service and the COVID intensive care unit were in April 2020 (Supplement Table 3).

The diagnosis codes that were most often used in the diagnosis of individuals who presented to the pandemic outpatient clinic were Z03, Z03.8, and Z03.9 (observation and evaluation for suspected diseases and conditions). The most frequently used diagnosis codes following those used for the diagnosis of suspected diseases were in the range of J00–J99, which were used for the diagnosis of respiratory system diseases (Supplement Table 4).

DISCUSSION

Emergency departments have an important role in the identification and treatment of suspected cases of COVID-19, which has high morbidity and mortality rates, as well as the uninterrupted delivery of healthcare for other medical emergencies.[5] Accordingly, this study provides important data in terms of protecting emergency department resources and increasing service efficiency.

In this study, the examination of the distribution of emergency department admissions during the year indicated that the number of admissions increased in April, May, and June in the emergency outpatient clinic and decreased in the pandemic outpatient clinic. It was seen that the number of admissions to the pandemic outpatient clinic in October, November, and December was higher than the number of admissions to the emergency outpatient clinic. In their study on patterns of emergency department visits and procedures during the COVID-19 pandemic, Baugh et al.[13] found a significant decline in emergency department presentations during 8 weeks of the early COVID-19 wave between March and April 2020 compared to the same weeks in 2019. It was determined that the mean level of severity of presentations to the emergency department was higher during 2020 and that it was accompanied by a rise in the number of critical care procedures performed in the emergency department and a fall in the number of low severity emergency department procedures. Jeffery et al.[14] found that there were small increases in emergency department presentations in 3 states, (Massachusetts, Colorado, and North Carolina) in late April 2020 while the trends in emergency department admissions and hospital admissions in health systems of 5 states in the first months of the COVID-19 pandemic in the USA in April 2020 was investigated. Also, they reported that the rates of hospitalizations from the emergency department were associated with the number of state-level new COVID-19 cases. Wee et al.[15] reported that 1,841 individuals presented to the emergency department in a 3-month time between January 1, 2020 and April 1, 2020 with respiratory syndromes that required admission or met the criteria for COVID-19 suspicion and that all of the cases tested positive for COVID-19 while they reseraced on containing COVID-19 in the emergency department.

When the distribution of presentations to the pandemic outpatient clinic according to age groups was examined, it was found that the highest number of presentations was in the 15-29 and 30-44 age groups, and the least number of presentations was in the 0-14 age group. These results were found to be consistent with similar studies in the literature.[16,17] One study stated that the mean age of all patients who applied to the emergency department with the suspicion of COVID-19 was 45.15, and the mean age of

confirmed COVID-19 cases was 47.55.[18] In their study on 1,099 confirmed COVID-19 cases, Güneysu et al. (2020) stated that the average age was 49.50 years.[19]

The distribution of emergency department admissions by gender in this study indicated that rates of male patient admissions were higher in both the pandemic outpatient clinic and the emergency outpatient clinic. Similarly study of Açıksarı and Kınık,[16] stated that 52.5% of the patients who presented to the emergency department in March and April 2020 were male. In some similar studies searching emergency department admissions observed that the rate of female patients was higher in emergency department admissions, unlike the findings of this study.[1,17,20]

Some studies have shown that COVID-19 infection is more common in males.[18,19,21,22] In this study, while the rates of positive cases were higher in females in some months, they were observed higher in males in other months. Considering the monthly average value over a 13-month period,the rates of positive cases were higher in males than in females with the neglected difference (0.045%).

Triage is very important in terms of distinguishing patients who are likely to be infected with the pathogen causing the disease during pandemics.[11] As a result of this study, We observed that 65.7% of emergency department presentations in November and 59.9% in December were referred to the pandemic outpatient clinic. This result was important in that it showed that the contact of individuals with suspected COVID 19 symptoms with other areas were cut off. Similarly, Wee et al. (2020) stated that most COVID-19 cases (84.2%, 59/70) were identified at emergency department triage since they met the criteria for suspected cases.[15]

In our study, we observed that the rates of chest X-ray and thoracic CT requests for diagnostic purposes were high in the first months in the pandemic outpatient clinic but that they gradually decreased afterward. The widespread utilization of PCR tests and their use as the main criterion in diagnosis was thought to be the reason for this decrease. İt was observed that the supply of medications to people who were deemed suitable for antiviral drug treatment was first started in May and that there was a decrease in medication initiation rates in the last months within the scope of the study according to the results of the PCR test. It was thought this might have been related to the new developments in the effectiveness of the drug used.[23]

According to the results of the study, the number of COVID service and COVID intensive care unit hospitalizations in October 2020, November 2020, and December 2020 was high. In addition, the number of hospitalizations referred from the emergency outpatient clinic to the COVID intensive care unit was higher than the number of patients referred from the pandemic outpatient clinic. This was considered to be due to the admission of severe COVID-19 cases to the red zone of the emergency department and the addition of these patients in the emergency outpatient clinic records on the HIMS database.

In this study, the most frequently used codes in the diagnosis of patients admitted to the pandemic outpatient clinic were Z03, Z03.8, and Z03.9 (observation and evaluation for suspicious diseases and conditions). This showed that the majority of patients referred to the pandemic outpatient clinic were identified as COVID-19 suspects. This result is an indication that triage is conducted effectively and that individuals are directed to the right area. It was determined that the number of people admitted to the pandemic outpatient clinic with the diagnosis code U07.3 (COVID-19) was high in April (177) and May (164) but decreased in other months. The reason for the falling numbers of COVID-19 diagnoses after these months was thought to be due to the widespread use of home follow-up system. After observation and evaluation for suspected diseases and conditions, the most frequently used diagnosis codes were in the range of J00–J99 used for the diagnosis of respiratory system diseases. In a study on the evaluation of patients presented to the emergency department, it was stated that respiratory system and pain complaints were the most common reasons for patient presentations.[24] On the other hand, in their meta-analysis study, Khan et al. (2020) stated that the most common co-morbidities in COVID-19 patients were HT, DM, and cardiovascular diseases, respectively.[25]

In conclusion, this study was conducted to evaluate patients who were diagnosed with COVID-19 in the emergency department in terms of their socio-demographic

characteristics and diagnosis codes and to examine the effect of the COVID-19 pandemic on presentations to the emergency department and its functioning. The study data showed the effect of the COVID-19 pandemic on emergency service admissions and functioning. Besides, they will contribute to the necessary education, planning, and organization processes for similar situations.

Conflict of Interest

The authors declare that there is not any conflict of interest regarding the publication of this manuscript.

Ethics Committee Permission

Approval for this study was received from Balıkesir University Clinical Research Ethics Committee (date 26.05.2021 and number 2021/126).

Authors' Contributions

Concept/Design: ÖT. Data Collection and/or Pro-cessing: AKB. Data analysis and interpretation: AKB, ÖT. Literature Search: ÖT, AKB. Drafting manuscript: ÖT, AKB. Critical revision of manuscript: ÖT, AKB.

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