Original Article

HEALTH SCIENCES
MEDICINE

DOI: 10.32322/jhsm.1099202
J Health Sci Med 2022; 5(3): 882-886

Comparison of ocular emergencies in the COVID-19 pandemic and pre-pandemic period in the tertiary hospital of Turkey

Selda Çelik Dülger, Mehmet Çıtırık, Esra Bahadır Camgöz, Mehmet Yasin Teke
University of Health Sciences, Ankara Ulucanlar Eye Training and Research Hospital Ankara, Turkey

Cite this article as: Çelik Dülger S, Çıtırık M, Bahadır Camgöz E, Teke MY. Comparison of ocular emergencies in the COVID-19 pandemic and pre-pandemic period in the tertiary hospital of Turkey. J Health Sci Med 2022; 5(3): 882-886.

ABSTRACT

Aim: To evaluate clinical characteristics and alterations in the of patients admitted to the ocular emergency department (ED) of a tertiary hospital during coronavirus disease period in 2019 (COVID-19) and pre-pandemic period. Also, we intended to share our strategy and experience to prevent disease transmission to health-care staff during patient submission.

Material and Method: In this study, 45901 patients who applied to ED between January and May in 2020 were reviewed retrospectively for ocular manifestations. The five months divided into two groups as the pre-pandemic period and the pandemic period. Clinical and demographic data were collected. The proportion of urgent and non-urgent cases in the pre-pandemic and pandemic period was compared.

Results: A total of 30,576 patients (66.6%) admitted to ED before COVID-19 and 15,325 patients admitted (33.4%) during COVID-19 era. Five hundred thirty-eight (1.8%) of cases admitted in the pre-pandemic period, and 395 (2.6%) of the cases admitted in the pandemic period were in the real urgent category. Conjunctivitis, blepharitis and hordeolum, dry eye diseases, corneal diseases were the most common conditions in both pre-pandemic and pandemic periods.

Conclusion: This study showed that admissions to ED for ocular conditions during the pandemic period decreased significantly, and the rate of real urgent cases increased. Yet even during the pandemic period, non-urgent patients continue to come to the ED.

Keywords: Coronavirus disease, COVID-19, emergency department, patient triage, ophthalmology

INTRODUCTION

Emergency departments (ED) are one of the most crowded units of hospitals. Overcrowding in EDs causes poor quality of care, increased waiting times, dissatisfaction, and increased anxiety of patients, increased cost (1) The most crucial cause of congestion in EDs seems to be an increased proportion of patients with non-urgent complaints. It is probably tempting for patients to be examined in ED in a shorter time and at any time. ED in our hospital serves only eye patients and shares similar problems with General EDs. Overcrowding of EDS has always been and will probably continue to be a problem, but this situation has been even more critical during the COVID-19 pandemic due to the transmission of the virus.

The coronavirus disease 2019 (COVID-19) emerged first in Wuhan, Hubei province, China, in December 2019 by leading an outbreak and turned into a global pandemic (2). The virus caused the disease was called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (3). As the disease spread all over the world in a short time. It was declared as a pandemic by the World Health Organization (4). The countries had to take various precautions such as mask use, social distancing, and stay-at-home rules. The first confirmed case of COVID-19 was declared in Turkey on March 11, 2020, and the early death due to COVID-19 occurred on March 18, which is the date when restrictions began throughout the country. As it is known, due to the high risk of nosocomial spread of the virus, measures were also taken in the hospitals, including delivering only urgent and emergent care, rescheduling visits, postponing elective procedures, and enhancing

Corresponding Author: Selda Çelik Dülger, drsldclk@gmail.com
Received: 06.04.2022 **Accepted:** 30.04.2022

personal protective measurements. Although all health-care workers have a risk of transmission of the virus, the ophthalmologist may be at increased risk of infection in examining patients with short working distance, especially during slit-lamp examination.

In this study, we aimed to evaluate the alterations in the number and proportion of ocular emergencies admitted to our hospital's ED during the COVID-19 period and pre-pandemic period in Ankara. We also wanted to share our strategy and experience to prevent the spread of the virus transmission to health-care staff.

MATERIAL AND METHOD

The study was carried out with the permission of Ankara Training and Research Hosptal, Non-Invasive Clinical Researches Ethics Committee (Date: 20.08.2020, Decision No:2020/374). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Participants and Study Design

A total of 45,901 patients admitted to our ocular ED between January and May in 2020 were included in this retrospective study. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Written consent was taken from all adult cases and the parents of the child cases. Our hospital was not assigned by the government for COVID-19 treatments. Therefore, it was one of the only hospitals where the eye patients admitted to in Ankara and neighbouring cities in the COVID-19 period and maintained care intensity like in the pre-COVID-19 period.

Data of all the cases admitted to the ED were collected from patients' records, including the patient's age, gender, and diagnosis. The cases were divided into groups according to their ages as the cases younger than 17-year-old, between 17 and 40-year old, and the instances older than 40-year old. The five months were divided into two groups as before COVID-19 and COVID-19 era, based on March 15. The reason for the baseline of March 15 is the first COVID-19 case was confirmed in our country on March 11 and then, as of March 15, official COVID-19 measures were started to be taken in hospitals. We compared the number of patients admitted to the ED 2.5 months before and after March 15.

In Turkey, the patients attending ED are divided into zones according to their priority. Green zone refers to care patients with the least emergent situation, while the red zone is for more urgent cases. After examination, patients are marked with green or red on the system according to immediate status. In this study, we determined the proportions of urgent and non-urgent cases using the zones.

Strategies to Prevent COVID-19 Spread in the Emergency Departments

With the onset of the covid 19 pandemic, the working strategies of the emergency room has changed markedly, as in all departments of our hospital. In order to exclude Covid 19, symptoms such as fever, a history of contact with someone with COVID-19 in the last 14 days, and cough were questioned in all patients who applied to the emergency department. If there were any of them, they were referred to an assigned pandemic hospital. Patients without symptoms or contact history were admitted to the emergency department. All patients who applied were encouraged of the obligation to wear masks and social distance rules. Waiting rooms were readjusted according to 1,5-meter social-distant. Health care providers applied universal personal protective measures like wearing surgical/N95 mask, gloves in the necessity, protective clothing, face shield, and googles. They were informed about the importance of hand washing and disinfection. Slit lamps were meticulously cleaned after each patient examination, and a transparent barrier was placed in slit lamps between ophthalmologists and patients. When examining, both examiner and patient had to be masked, and the room was well ventilated. In hospitals assigned pandemic, patients who are not in the urgent or emergent category were informed about the necessity of examination under elective conditions, not in ED, as the intensity of the ED was tried to be reduced. But this situation could not be applied in hospitals designated as non-pandemic.

Statistical Analysis

Statistical analyses were performed with SPSS 21 (IBM, New York, USA) program. Frequencies and percentages were presented for categorical variables. An independent t-test was used to compare differences between groups because the data were normally distributed.

RESULTS

The mean age of 28,334 (61.7%) male and 17,567 (38.3%) female cases were 37.84±19.73 (range; 0-100). The age distribution of patients were 7,315 (16%) in younger than 17-year-old, 17,908 (39%) in between 17 and 40-year-old, 20,678 (45%) in older than 40-year-old.

A total of 30,576 patients (66.6%) admitted to ED before the COVID-19 era (before March 15) and 15,325 patients admitted (33.4%) during COVID-19 era (**Table 1**). Five hundred thirty-eight (1.8%) of cases admitted pre-pandemic era, and 395 (2.6%) of the cases admitted pandemic era were in real urgent category. It was determined that a significant decrease in the number of patients who applied to ED in the COVID-19 era. ($p<0,05$) The percentage of rel urgent cases during the COVID-19 era was higher than before the COVID-19 era (**Figure 1** and **Table 1**).

Table 1. Admissions rates to the emergency department in pandemic and pre-pandemic period

	Total Count	Non-urgent Count	Urgent Rate	Count	Rate
Pre-pandemic period	30,576	30,038	98.2%	538	1.8%
Pandemic period	15,325	14,930	97.4%	395	2.6%

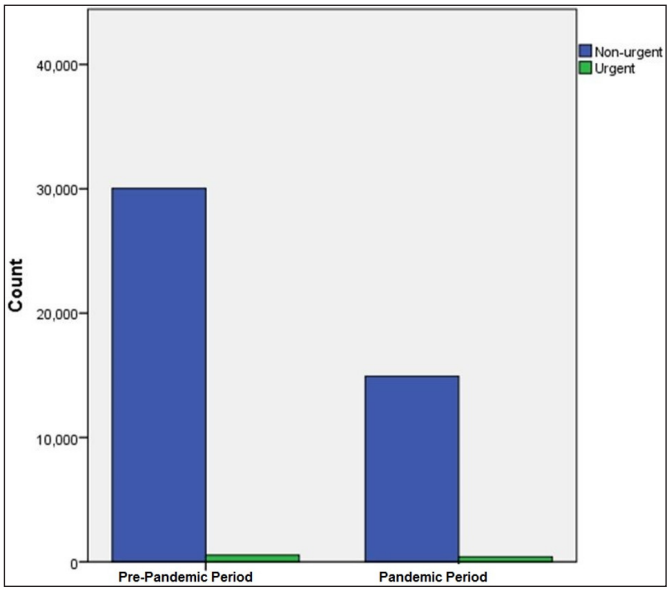

Figure 1. Urgent and non-urgent cases in pandemic and pre-pandemic period

Conjunctivitis (including allergic, chronic), blepharitis and hordeolum, dry eye diseases (feeling of ocular surface discomfort and meibomitis were also evaluated in this category), corneal diseases (including corneal foreign body and keratitis) were the most common conditions both pre-pandemic and pandemic period. Some situations were summarized in **Table 2**. The distribution of diagnoses of the cases by the COVID-19 period and months were summarized in **Table 2**, **Figure 2**, and **Figure 3**.

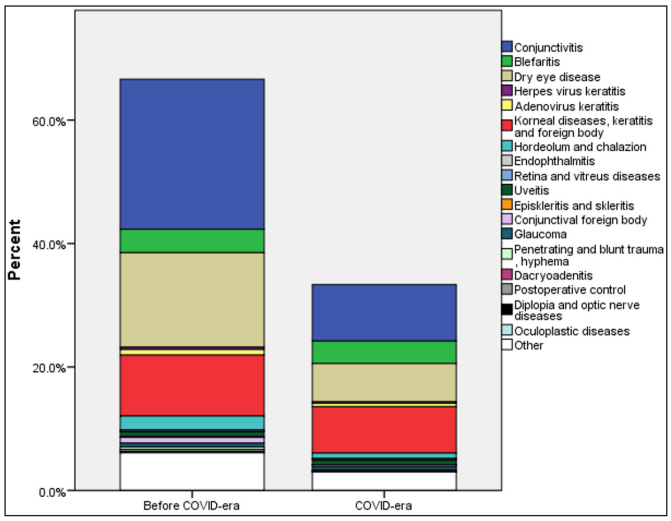

Figure 2. The distribution of diagnoses of the cases by the pandemic and pre-pandemic period

Table 2. Distributions of the patients with pandemic and pre-pandemic period in terms of common diagnosis

Diagnosis	Pre-Pandemic Period		Pandemic Period	
	Count	Column N %	Count	Column N %
Conjunctivitis	11158	36.5%	4203	27.4%
Blefaritis	1747	5.7%	1680	11.0%
Dry eye disease	7020	23.0%	2842	18.5%
Herpes virus keratitis	170	0.6%	111	0.7%
Adenovirus keratitis	424	1.4%	249	1.6%
Korneal diseases, keratitis and foreign body	4527	14.8%	3459	22.6%
Hordeolum and chalazion	1056	3.5%	418	2.7%
Endophthalmitis	6	0.0%	2	0.0%
Retina and vitreus diseases	109	0.4%	119	0.8%
Uveitis	351	1.1%	308	2.0%
Episkleritis and skleritis	72	0.2%	34	0.2%
Conjunctival foreign body	423	1.4%	124	0.8%
Glaucoma	279	0.9%	231	1.5%
Penetrating and blunt trauma , hyphema	177	0.6%	86	0.6%
Dacryoadenitis	17	0.1%	16	0.1%
Postoperative control	188	0.6%	34	0.2%
Diplopia and optic nerve diseases	7	0.0%	10	0.1%
Oculoplastic diseases	55	0.2%	17	0.1%
Other	2789	9.1%	1382	9.0%

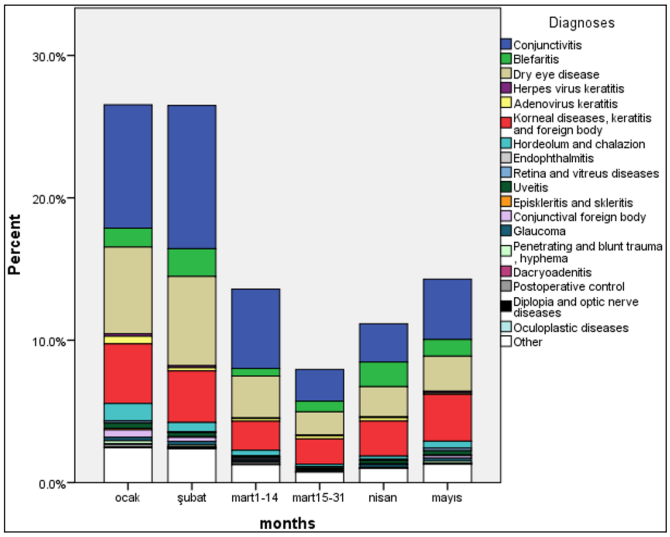

Figure 3. The distribution of diagnoses of the cases by months

DISCUSSION

The ED of our hospital in Ankara, Turkey, serves about the number of 12 500 patients a month (data in 2019) as one of the most crowded EDs. The total amount of ED examinations between January and May in 2020 was 49.501 patients. When we compared the amounts of ED examinations before and after March 15, we found that a significant decrease in the number of patients admitted to ED during the COVID-19 period. At the same time, we observed an increased proportion of real urgent cases during COVID-19. The restriction of outdoor explains

the reduction during this period. Besides, the fear of being infected by going to the hospital and statement of government and health-care professionals like keeping away from the hospital except for urgent situations could be efficient.

As in other EDs in Turkey, in our ocular ED, the most common problem is overcrowding, which puts both personnel and patients in a problematic situation. The most important reason for the congestion of EDs is the application of patients with non-urgent complaints consistent with the literature (2,5). The people in Turkey may be applied to EDs with the financial concerns, the expectation of rapid service, or avoiding the necessity of appointment (2). The other significant reason is the feasible hours of operation. Open 24 hours a day, seven days a week, and EDs are a great convenience to the community (6). Also, some patients applying to ED may think that their ocular condition is emergent. In our study, only 1.8% (538 of 30,038 in total) of the cases accessed to ED in the 2.5 months before COVID-19 were in the real urgent category (marked red zone). During the COVID-19 era, the rate increased to 2.6% (395 of 14,930 in total). Consistent with our results, it has been reported in the literature that less than 3% of patients applying to EDs need vital interventions (7). One of the essential findings detected in this study is that non-urgent patients continue to come to the ED even during the pandemic period.

Carvalho and José (8) reported that 55% of the cases admitted to the ocular emergency had inflammatory conditions such as conjunctivitis, blepharitis, chalazion, or hordeolum, all of which need to be treated in primary or secondary care units. In our report, similar to this study, 33.5% had conjunctivitis, 21.5% had dry eye or meibomitis, 17.4% had corneal diseases (keratitis and corneal foreign body), and 7.5% had blepharitis, respectively, in both periods.

The demographic characteristics of our sample were similar to the previous reports (9,10), and the number of males admitted to ED for ocular conditions was higher than females. (61.7% to 38.3%). The average age of our sample was 37.84 years, and most of the patients (45%) had within the range 41 to 100 years. Similar to our study, in a study in which epidemiology of ocular emergencies was evaluated, the majority of admissions were reported as middle-aged men (11).

Transmission of SARS-CoV2 is known to occur by respiratory droplet, aerosol, and contact. Ophthalmologists can be considered as one of the most risky professions in the covid-19 pandemic, since the examination performed by them with slit lamp and ophthalmoscope is shorter than the safe social distance of 1.5-2 meters (12). During the severe acute respiratory syndrome (SARS) outbreak in 2003, many health care providers infections alerted medical institutions to take more severe precautions in case of a future epidemic (13). Unfortunately, thousands of health care workers have been infected during COVID-19. As mentioned above, a strategy was developed for protection during clinical practice according to guidelines. Triage was one of the most important of them. A detailed COVID-19 and ocular history were taken from the patients before entering the waiting room. All personal protective measures were taken, even if contact history and fever were regular, as the ability to spread the infection was known during the asymptomatic period. Patients who were not urgent in ocular history were turned back to protect both health care workers and patients from the risk of infection caused by crowding in the ED of the pandemic hospital. During this period, none of the health care providers working in our hospital was infected with SARS-CoV2. Although a significant decline in the total number of patient admissions in the COVID-19 period, a tiny proportion of patients had a genuinely urgent medical condition. This determination is crucial to demonstrate the inappropriate utilization of the ED, even during the COVID-19 period.

CONCLUSION

As our knowledge, this is the first study to evaluate diagnoses and alterations in the number of patients admitted to the ocular ED during the COVID-19 period. The most common conditions for emergency admissions were inflammatory ocular surface conditions that do not need to be urgently treated in ED. This study revealed that the majority of patients entries to the ocular emergency department were not real urgent neither COVID-19 period nor before.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of the Ankara Training and Research Hosptal, Non-invasive Clinical Researches Ethics Committee (Date: 20.08.2020, Decision No: 2020/374)

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

REFERENCES

1. Erenler AK, Akbulut S, Guzel M, Cetinkaya H, Karaca A, Turkoz B. Reasons for overcrowding in the emergency department: Experiences and suggestions of an education and research hospital. Turkiye Acil Tip Derg 2014; 14: 59-63.
2. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. Lancet 2020; 395: 470–3.
3. COVID-19. World Health Organization. https: //www.ecdc.europa.eu/en/novel-coronavirus-china. Last viewed February 18, 2020.
4. Coronavirus disease (COVID-19) Pandemic. https: //www.who.int/emergencies/diseases/novel-coronavirus-2019, Last viewed April 27, 2020.
5. Arinah WDS, Faisal I, Juni Muhamad Hanafiah, Ismail I, Mohamed AS. Factors associated with emergency department green zone utilization in hospital. Int J Public Heal Clin Sci 2016; 3: 159-73.
6. Khan Y, Glazier RH, Moeneddin R, Schull MJ. A Population-based study of the association between socioeconomic status and emergency department utilization in Ontario, Canada. Acad Emerg Med 2011; 18: 836-43.
7. Cour des Comptes: Rapport public annuel. Première partie - Lesobservations des juridictions financières. Les urgences médicales: constatset évolution récente. Février 2007; 313-47.
8. Carvalho RDS, José NK. Ophthalmology emergency room at the University of São Paulo General Hospital: a tertiary hospital providing primary and secondary level care. Clinics (Sao Paulo) 2007; 62: 301-8.
9. El-Mekawey HE, Abu El Einen KG, Abdelmaboud M, Khafagy A, Eltahawy EM. Epidemiology of ocular emergencies in the Egyptian population: a five-year retrospective study. Clin Ophthalmol 2011; 5: 955-60.
10. Sen E, Celik S, Inanc M, Elgin U, Ozyurt B, Yilmazbas P. Seasonal distribution of ocular conditions treated at the emergency room: A 1-year prospective study. Arq Bras Oftalmol 2018; 81: 116-9.
11. Cheung CA, Rogers-Martel M, Golas L, Chepurny A, Martel JB, Martel JR. Hospital-based ocular emergencies: epidemiology, treatment, and visual outcomes. Am J Emerg Medb2014; 32: 221-4.
12. Olivia Li J-P, Shantha J, Wong TY, et al. Preparedness among ophthalmologists: during and beyond the COVID-19 pandemic. Ophthalmology 2020; 127: 569–72.
13. Wang Q, Wang X, Lin H. The role of triage in the prevention and control of COVID-19. Infect Control Hosp Epidemiol 2020: 1-5.