

ORIGINAL ARTICLE

Medicine Science 2021;10(2)396-9

Have problems been experienced in the treatment of eye patients during the COVID-19 pandemic? **Abdulgani Kaymaz**,  **Adem Soydan***Bolu Abant Izzet Baysal University, Faculty of Medicine, Department of Ophthalmology, Bolu, Turkey*Received 16 February 2021; Accepted 21 March 2021
Available online 25.03.2021 with doi: 10.5455/medscience.2021.02.047Copyright©Author(s) - Available online at www.medicinescience.org
Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.**Abstract**

To investigate whether there are delays in the treatment of patients with eye diseases during the Covid-19 pandemic. Two hundred patients were included in the study. The problems experienced in the treatment of the patients due to the pandemic and the cause of these problems were investigated. The number of patients whose treatment was delayed was 84 and the mean delay time in treatment was 4.51 ± 2.16 months. The patients who delayed the treatment the most were patients with glaucoma, retinal vascular occlusion, cataract, diabetes mellitus, age-related macular degeneration, and hypertension (86%, 75%, 64%, 53%, 43%, 33%, respectively). The rate of patients presenting due to decreased visual acuity was 24%. It was observed that 39% of all patients had coronaphobia. It is obvious that pandemic disrupts the treatment process of many diseases, including eye diseases. It will be beneficial to create new treatments and follow-up protocols for chronic eye diseases for pandemic periods.

Keywords: Coronaphobia, Coronavirus disease-2019 (covid-19), diabetes mellitus, glaucoma, pandemic, vision loss**Introduction**

Coronavirus disease 2019 (COVID-19), which emerged in December 2019, rapidly affected the whole world, causing two million deaths and more than 100 million people to become sick [1]. The economies of the countries were damaged due to the disease, health and education services were disrupted. New vaccines that have been approved have been put into practice, but the pandemic has not yet been stopped [2,3].

Although COVID-19 primarily affects the respiratory system, it can cause multisystem involvement in the body [4]. It especially affects individuals over the age of 65, but it has been reported that it can cause serious disease in children [5,6]. Since COVID-19 spreads very rapidly, has a more severe course in patients with comorbid diseases, even causes death, restrictions have been put into effect in our country and in many countries. Schools, universities and workplaces were closed. 2-week quarantine was

applied to patients and those who had contact with the patients. In our country, curfews were imposed for about 3 months, especially in metropolitan cities, including weekends and sometimes weekdays. Due to these restrictions, serious delays occurred in the diagnosis, treatment and follow-up of many patients especially with chronic diseases [7,8]. Since there was no place in intensive care units, the treatment of patients who need intensive care, especially patients with acute myocardial infarction (MI) and cerebrovascular occlusion (CVO), was disrupted and deaths occurred [9,10]. The world was caught unprepared for the epidemic, the health system collapsed in some of the countries, fast solutions and applications were put into effect [11,12]. In this process, the interest in telemedicine among doctors increased and patients were tried to be reached with this method, even partially [11,13,14].

COVID-19 caused disruptions in the functioning of all clinics in hospitals, and eye clinics were also affected by this condition. Especially, problems occurred in the follow-up and treatment of patients with chronic eye diseases such as glaucoma, retinal vascular occlusion (RVO), cataract, diabetes mellitus (DM), age-related macular degeneration (AMD), hypertension (HT), and patients who needed intravitreal injections (IVIs) [8,15-17]. It is obvious that these patients will have vision loss, but it is difficult to determine this effect because the epidemic continues.

***Corresponding Author:** Abdulgani Kaymaz, UBolu Abant Izzet Baysal University, Faculty of Medicine, Department of Ophthalmology, Bolu, Turkey
E-mail: kaymaz9@hotmail.com

As in other countries, a flexible working system has been put into use in hospitals in our country due to the pandemic in order to protect healthcare workers and prevent the spread of the disease. In the out-patients' clinics, there was no restriction in the provision of health services to emergency and cancer patients, but patients other than these were only seen by appointment systems [18]. Patients had to disrupt their treatment due to restrictions and/or difficulty in reaching doctors. After it was determined that the virus could be transmitted through eye fluids, more stringent measures were taken in eye clinics [18]. In addition, most of the patients disrupted their treatment due to coronaphobia. Coronaphobia is spreading rapidly all over the world [19]. It is a psychological disorder called the fear of being catch COVID-19 and dying and can be caused especially by the frightening news spread rapidly from social media, the internet, and television (TV) [20]. However, regardless of the cause, it is known that many patients have disrupted their treatment and suffered from it due to the pandemic. In the future, the data obtained by collecting the data of more than one clinic in a wide range will reveal this situation more clearly.

The aim of this study is to draw attention to the delayed diagnosis, follow-up, and treatment of patients with chronic eye disease due to the pandemic, to reveal the negative effects of this situation, and to ensure the necessary precautions are taken urgently.

Material and Methods

Our study was conducted on patients who applied to Bolu Abant İzzet Baysal University Medical Faculty Hospital Ophthalmology Clinic. The approval of the local ethics committee of the same university was obtained (no: 2020/249), the consent form was filled out by the patients, and the Helsinki Declaration principles were followed in the study.

A total of 200 patients, 105 male, and 95 female were included in the study. The form prepared for the study was filled in by the ophthalmologist who participated in the study in the form of questions and answers. In the study, it was investigated whether the patients arrived on time for treatment due to COVID-19. The reason for the delay was analyzed in patients with delayed treatment. Then, routine eye examinations of the patients were performed such as visual acuity (VA), anterior-posterior segment examination with biomicroscopy, intraocular pressure measurement, strabismus examination. When deemed necessary, additional examinations and tests were performed (such as optical coherence tomography, visual field, anterior segment imaging, topography). The new examination information of the patients followed up was compared with the old ones. Problems caused by the delay were noted.

Statistical analysis of all data used in the study was done with SPSS version 25.0 for Windows. The independent sample t-test was used to evaluate parametric data, and the chi-square test was used for non-parametric data. Data were calculated as number, mean±standard deviation, and percentage. A p-value of <0.05 was considered statistically significant.

Results

Characteristics of the patients participating in the study are summarized in Table 1. The mean age of all patients was 49.83±22.46 years (min-max: 4-85 years). The mean age of the patients whose treatment was delayed due to the COVID-19 pandemic was 50.15±23.47 years, and the patients whose treatment was not delayed was 49.58±21.79 years. Most of the study patients were married people (72.5%).

Table 1. Characteristics of all patients who applied to the ophthalmology clinic

	All patients (n), (%)	Patients with Delayed Treatment (n)	Patients without Delayed Treatment (n)
Gender (Male/Female)	105 / 95 (52.5 % / 47.5 %)	46/38	59/57
Marital status (married/single)	145 / 55 (72.5 % / 27.5 %)	62/22	82/34
Hypertension	67 (33.5 %)	22	45
Diabetes mellitus	30 (15 %)	16	14
AMD	28 (14 %)	12	16
Cataract	28 (14 %)	18	10
Strabismus ± amblyopia	18 (9 %)	1	17
Dry eye	9 (4.5 %)	3	6
Retinal vascular occlusion	8 (4 %)	6	2
Glaucoma	7 (3.5 %)	6	1
Uveitis	2 (1 %)	1	1
Wearing glasses ± CL	66 (33 %)	21	45
Coronaphobia	78 (39 %)	63	15
Decreased visual acuity	48 (24 %)	34	14

AMD: Age-related macular degeneration, CL: Contact lens, n: Number of patients

Eighty-two of all patients who applied to our clinic had no other disease than eye diseases. In the other 118 patients, at least one additional disease accompanying eye disease was detected. HT, DM, AMD, and cataracts were detected in most of the patients who applied to the clinic. Patients with glaucoma, RVO, cataracts, DM, AMD, HT, and those using glasses and/or contact lenses were determined to be the patients whose treatment delays the most (86%, 75%, 64%, 53%, 43%, 33%, 32%, respectively). Patients who were brought to their controls on time and whose treatment was not delayed were pediatric patients with a diagnosis of strabismus and/or amblyopia (6%).

The number of patients whose treatment was delayed due to the COVID-19 pandemic was 84 (42%), and the mean delay time in the treatment of these patients was 4.51 ± 2.16 months (min-max: 1-9 months). It was determined that the number of patients who came to the control visits on time was 116. Approximately 24% (48/200) of the patients were applied to the hospital due to a decrease in VA. Most of the patients with decreased VA (34/48 patients) consisted of patients whose treatment was delayed, and decreased VA was found in almost all of these patients on eye examinations. In addition, no pathology was found in the eye examination of 8 patients whose treatment was delayed and who described vision loss. In contrast, a 7-year-old strabismus and anisometropic amblyopia patient, whose controls were disrupted and claimed to have no problem, was found to have 20% vision loss.

Coronaphobia was detected in 39% of the patients (78 patients) in our study. Thirty-seven of the patients with coronaphobia were affected by news on the internet and/or TV, 22 from people around, 19 from both the environment and news and 9 were affected by the statements of doctors. Unfortunately, 81% (63 patients) of patients with coronaphobia had to delay their treatment because of this fear. In addition, 60% of these patients with coronaphobia (38 patients), whose treatment was delayed, had a decrease in VA.

Discussion

During the COVID-19 pandemic, it was observed that VA decreased and treatment was delayed in a significant number of eye patients participating in our study. There are still a considerable number of active COVID-19 patients around the world, and hospitals still cannot provide enough healthcare services to patients other than COVID-19.

In our study, it was observed that the treatments of glaucoma, RVO, DM, and AMD patients were significantly delayed due to the pandemic and the VA of the patients decreased (57%, 63%, 47%, 21%, respectively.). It is known that delaying the treatment of glaucoma, which is known to have an insidious course in society and is generally diagnosed late, causes irreversible losses in the retinal ganglion cells and thinning of the retinal nerve fiber layer [17,21]. Most of the retina unit patients in ophthalmology consist of patients with DM, AMD, and RVO, and a significant part of these patients receive the regular intravitreal injection and/or retinal laser photocoagulation treatment. Delaying routine intravitreal injection practices causes deterioration of retinal homeostasis, increase macular edema and inflammation in the retina, and permanent vision loss [22,23]. It was observed that control visits of 33% of patients with HT were delayed and VA decreased in

28% of these patients. Unfortunately, it is known from previous studies that uncontrolled DM and HT cause damage to retinal ganglion cells and lead to permanent vision loss [23,24]. In our study, the rate of delaying treatment in patients using glasses and/or contact lenses was found to be 32%. Although refraction values do not change much in adult patients, these values may change in a short time in patients with strabismus and/or amblyopic children [25]. Therefore, these patients should be followed-up closely, their controls should not be disrupted and their glasses numbers should be adjusted correctly. A remarkable and pleasing point in our study is that almost all patients with strabismus and/or amblyopia were brought to the control visits on time.

Studies have reported that delaying the treatment of patients who need eye surgery (especially cataract, retinal detachment, glaucoma surgery) leads to an increase in the risk of complications and permanent vision loss [26,27]. In our study, it was observed that 64% of cataract patients delayed their surgery due to the pandemic. The reason for this delay is not only the inability to reach the doctor but also the postponement of elective surgeries for more than 3 months due to the pandemic in our country. In the study conducted by Rutar et al., it was reported that the risk of intraoperative complications increased significantly in cataract patients whose treatment was delayed [26]. Eijk et al. reported that delayed retinal detachment surgery results in a worse prognosis and more vision loss [27].

During the COVID-19 pandemic, coronaphobia has spread rapidly in society along with the virus [19]. Social media, the internet, and TV have a great effect on the development of this psychological disorder [20]. Coronaphobia was detected in 39% of all patients in our study, and this rate should be taken seriously. Because it was observed that 81% of these patients delayed their treatment because of fear. As a result, 60% of these patients whose treatment was delayed had decreased VA. It was observed that the patients with coronaphobia in our study were primarily affected by the news on the internet and TV, and then by the people around and the statements of the doctors.

Due to the restrictions imposed during the pandemic process and the strict precautions are taken in the hospitals, the reachability to doctors has decreased. Some hospitals were turned into pandemic hospitals, where only patients with COVID-19 were served. Emergency and cancer patients' healthcare services were not restricted, but patients other than these were only examined through an appointment system. In our study, 7 patients whose treatment was delayed stated that they could not come to the hospital because they could not make an appointment. Fortunately, the number of these patients was not much and only two of them had a decrease in VA. While the pandemic process continues, studies should be carried out on permanent solutions to ensure that patient treatments are not delayed, and patients should be informed more about this issue. It is useful to emphasize the importance of telemedicine here. This application will be an indispensable part of the health services provided in the future [11,13]. With telemedicine, reach to a doctor will increase and patients will not be invited to the hospital unless it is necessary. Thus, the crowd occurring in hospitals will be prevented, health services will be provided in a better way, and both economic and time will be saved.

Our study has some limitations. First of all, the number of patients was limited and only patients with follow-up who applied to the outpatient clinic were included in the study. Therefore, the data of patients who could not be followed-up, whose treatments were in progress, who were hospitalized due to illness, or who were treated in the intensive care units were excluded from the study. In addition, it is not known whether this condition is permanent or not in patients with reduced visual acuity. It is also not clear how much they will benefit from the reinitiated treatments. To understand this requires long-term follow-up. In addition, it is not known whether patients with comorbid diseases are followed up regularly in other clinics. Despite all the limitations, as far as we know, there is no study in the literature emphasizing this aspect of COVID-19. Thus, the data obtained are valuable and can be a guide for similar studies to be conducted. Collecting more than one clinical data together with a higher number of patients and conducting long-term studies will allow a better understanding of the subject.

As a result, regardless of the cause, the diagnosis, treatment, and follow-up of a large number of patients have been interrupted by the COVID-19 pandemic, and patients have suffered more or less due to this. There is a similar situation in other clinics such as the eye clinics. In order not to fall into the same mistake, the necessary improvements in the health systems of the countries should be made immediately for new pandemics that may occur and should always be prepared against pandemics. Creating pandemic areas in ophthalmology clinics that will only serve patients with COVID-19 will minimize vision loss and damage that may occur in patients.

Conflict of interests

The authors declare that they have no competing interests.

Financial Disclosure

All authors declare no financial support.

Ethical approval

This study was performed in adherence with the tenets of the Declaration of Helsinki and was approved by local ethical committee (no: 2020/249).

References

- WHO. WHO's COVID-19 data. <https://covid19.who.int> access date 15.02.2021
- Polack FP, Thomas SJ, Kitchin N, et al. Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine. *N Engl J Med*. 2020;383:2603-2615.
- Baden LR, El Sahly HM, Essink B, et al. Efficacy and safety of the mRNA-1273 SARS-CoV-2 vaccine. *N Engl J Med*. 2021;384:403-16.
- Temgoua MN, Endomba FT, Nkeck JR, et al. Coronavirus disease 2019 (COVID-19) as a multi-systemic disease and its impact in low-and middle-income countries (LMICs). *SN Compr Clin Med*. 2020;2:1377-87.
- Mi J, Zhong W, Huang C, et al. Gender, age and comorbidities as the main prognostic factors in patients with COVID-19 pneumonia. *Am J Transl Res*. 2020;12(10):6537.
- Yoldas MA, Yoldas H. Pediatric COVID-19 Disease: A Review of the Recent Literature. *Pediatric Annals*. 2020;49:e319-e325.
- Kumar D, Dey T. Treatment delays in oncology patients during COVID-19 pandemic: A perspective. *J Glob Health*. 2020;10:010367.
- Nair AG, Gandhi RA, Natarajan S. Effect of COVID-19 related lockdown on ophthalmic practice and patient care in India: Results of a survey. *Indian J Ophthalmol*. 2020;68(5):725-730.
- Cohen S, Sprung C, Sjøkvist P, et al. Communication of end-of-life decisions in European intensive care units. *Intensive Care Med*. 2005;31:15-21.
- Mahmud E, Dauerman HL, Welt FG, et al. Management of acute myocardial infarction during the COVID-19 pandemic. *JACC*. 2020;76:1375-84.
- Bhaskar S, Bradley S, Chattu VK, et al. Telemedicine across the globe-position paper from the COVID-19 pandemic health system resilience PROGRAM (REPROGRAM) international consortium (Part 1). *Front Public Health*. 2020;8:556720.
- Fagherazzi G, Goetzing C, Rashid MA, et al. Digital health strategies to fight COVID-19 worldwide: challenges, recommendations, and a call for papers. *J Med Internet Res*. 2020;22:e19284.
- Saleem SM, Pasquale LR, Sidoti PA, et al. Virtual ophthalmology: telemedicine in a Covid-19 era. *Am J Ophthalmol*. 2020;216:237-242.
- Parrish RK, II EJH. What Does Telemedicine Mean for the Care of Patients With Glaucoma in the Age of COVID-19?. *Am J Ophthalmol*. 2020;218:A1-A2.
- Korobelnik J-F, Loewenstein A, Eldem B, et al. Guidance for anti-VEGF intravitreal injections during the COVID-19 pandemic. *Graefes Arch Clin Exp Ophthalmol*. 2020;258:1149.
- Saleh OA, Jammal H, Alqudah N, et al. Clinical experience in the administration of intravitreal injection therapy at a tertiary university hospital in Jordan during the COVID-19 lockdown. *Clin Ophthalmol*. 2020;14:2473.
- Jayaram H, Strouthidis NG, Gazzard G. The COVID-19 pandemic will redefine the future delivery of glaucoma care. *Eye*. 2020;34:1203-5.
- Wan KH, Huang SS, Young AL, et al. Precautionary measures needed for ophthalmologists during pandemic of the coronavirus disease 2019 (COVID-19). *Acta Ophthalmol*. 2020;98:221-22.
- Asmundson GJ, Taylor S. Coronaphobia: Fear and the 2019-nCoV outbreak. *J Anxiety Disord*. 2020;70:102196.
- Arora A, Jha AK, Alat P, et al. Understanding coronaphobia. *Asian Journal of Psychiatry*. 2020;54:102384.
- Heijl A, Leske MC, Bengtsson B, et al. Reduction of intraocular pressure and glaucoma progression: results from the Early Manifest Glaucoma Trial. *Arch Ophthalmol*. 2002;120:1268-79.
- Song W, Singh RP, Rachitskaya AV. The Effect of Delay in Care Among Patients Requiring Intravitreal Injections. *Ophthalmology Retina*. 2020.
- Duh EJ, Sun JK, Stitt AW. Diabetic retinopathy: current understanding, mechanisms, and treatment strategies. *JCI insight*. 2017;2.
- Meyer-Rüsenberg B, Pavlidis M, Stupp T, et al. Pathological changes in human retinal ganglion cells associated with diabetic and hypertensive retinopathy. *Graefes Arch Clin Exp Ophthalmol*. 2006;245:1009-18.
- Cotter S. Pediatric Eye Disease Investigator Group 2006 Treatment of anisometropic amblyopia in children with refractive correction. *Ophthalmology*. 113:895-903.
- Rutar T, Porco TC, Naseri A. Risk factors for intraoperative complications in resident-performed phacoemulsification surgery. *Ophthalmology*. 2009;116:431-6.
- Eijk ES, Busschbach JJ, Timman R, et al. What made you wait so long? Delays in presentation of retinal detachment: knowledge is related to an attached macula. *Acta Ophthalmol*. 2016;94:434-40.