

The effects of the Covid-19 pandemic on eye-related emergency visits

Efeitos da pandemia da Covid-19 em atendimentos de emergência ocular

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ABSTRACT

Objective: To evaluate the effects of the Covid-19 pandemic on the profile of emergency eye-related visits and compare the findings with the same period before the pandemic.

Methods: Cross-sectional study performed during one year at a reference eye hospital. Cases registered at the emergency Municipal Hospital Complex of Santo Andre, Brazil, between March, 2019 and February, 2020 were included in the study as the Pre-pandemic group. Cases registered between March, 2020 and February, 2021 were included as the Pandemic group. Cases were classified according to the International Classification of Diseases ICD-10 and Related Health Problems.

Results: There was a decrease of 52.1% in the emergency eye care visits during the pandemic period (n=9,198) when compared to the pre-pandemic period (n=19,220), with significant reductions in nonspecific cases (-98.1%), postoperative visits (-67.0%), disorders of the conjunctiva (-54.1%), tear film (-49.4%) and refraction (-85.6%) during the pandemic period. Conditions such as retina disorders (+202.7%), sclera disorders (+76.2%), orbit disorders (+20.2%), glaucoma (+66.6%) and trauma (+19.4%) have shown increased rates, as well as those related to eyelids (+186.9%), cornea (+33.4%), uvea (+40.2%), and herpes (+55.3%).

Conclusion: A drastic reduction in the number of eye-related emergency visits was observed during the Covid-19 pandemic, outlining a new profile of care, with higher frequency of sight-threatening conditions and lower frequency of contagious and non-specific diagnosis.

RESUMO

Objetivo: Avaliar os efeitos da pandemia da Covid-19 no perfil dos atendimentos oftalmológicos de emergência e comparar os achados com os do período anterior à pandemia.

Métodos: Estudo transversal realizado ao longo de 1 ano em um hospital oftalmológico de referência. Casos registrados no Complexo Hospitalar Municipal de Emergências de Santo André (SP, Brasil) entre março de 2019 e fevereiro de 2020 foram incluídos no estudo como Grupo Pré-Pandemia. Os casos registrados entre março de 2020 e fevereiro de 2021 foram incluídos no Grupo Pandemia. Os casos foram classificados de acordo com a Classificação Internacional de Doenças e Problemas Relacionados à Saúde.

Resultados: Houve redução de 52,1% no número de atendimentos oftalmológicos de emergência durante o período pandêmico (n=9.198) quando comparado ao pré-pandêmico (n=19.220), com reduções significativas em casos inespecíficos (-98,1%), visitas pós-operatórias (-67,0%), distúrbios da conjuntiva (-54,1%), filme lacrimal (-49,4%) e refração (-85,6%) durante o período de pandemia. Condições como distúrbios da retina (+202,7%), distúrbios da esclera (+76,2%), distúrbios da órbita (+20,2%), glaucoma (+66,6%) e trauma (+19,4%) apresentaram taxas aumentadas, bem como aquelas relacionadas a pálpebras (+186,9%), córnea (+33,4%), úvea (+40,2%) e herpes (+55,3%).

Conclusão: Observou-se drástica redução no número de atendimentos oftalmológicos durante a pandemia da Covid-19, delineando um novo perfil de atendimento, com maior frequência de quadros que levam à baixa de visão e à menor frequência de diagnósticos contagiosos e inespecíficos.

INTRODUCTION

Eye-related emergency units are uncommon in most places, despite the undeniable relevance of immediate and correct medical conduct in these situations. In several health services, it is not an ophthalmologist who performs the first care, and most of the general doctors are not prepared to provide adequate ocular treatment and management, which can lead to loss of the patient's visual capacity.^(1,2)

The first cases of a respiratory failure of unknown cause were reported in Wuhan, Hubei, China, in December, 2019, but it was only in March 2020 that the World Health Organization (WHO) declared a state of global pandemic caused by this new entity named coronavirus disease 2019 (Covid-19). Covid-19 is an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), whose transmission occurs mainly through the contact with contaminated people or surfaces.^(3,4)

As the pandemic spread throughout the world, Brazil was highly affected and reached the mark of 1 million cases by the middle of 2020.⁽⁵⁾ The global overall strategic measures strongly recommended by WHO as an attempt to control the spread of the virus included social distancing, hand hygiene, and the use of face masks.⁽²⁻⁴⁾

As a consequence of policies as social distancing, the number of visits in hospitals and health centers has drastically decreased.^(6,7) This trend was not different in both emergency and non-emergency eye care services. In order to respect the measures to control the dissemination of Covid-19, the American Association of Ophthalmology (AAO) recommended that ophthalmologists avoid any appointments, exams, or elective procedures, keeping only cases of extreme urgency or emergency.⁽⁸⁾

The purpose of this study is to evaluate the effects of the Covid-19 pandemic and lockdown on the profile of emergency eye-related visits along one year in a reference eye hospital in São Paulo, Brazil, and to compare it to the same period prior the pandemic.

METHODS

Cross-sectional study with data were derived from the *Complexo Hospitalar Municipal de Emergências de Santo André*, a division from the Department of Ophthalmology at the *Centro Universitário Faculdade de Medicina do ABC*, Santo André (SP, Brazil). All eye-related cases registered between March 1st 2019 and February 28th 2020 were included in the study as the Group Pre-Pandemic. Cases registered between March 1st 2020 and February 28th

2021 were included in the study as the Group Pandemic. All cases were classified according to the International Classification of Diseases (ICD) 10 code selected on the patients' evaluation day as this is a mandatory step in any medical consultancy in the service.

Data were collected retrospectively from the electronic medical records considering all the visits to the emergency eye care service during the date ranges. The codes of the International Classification of Diseases were grouped into broader categories for the analysis. The study protocol was approved by the *Centro Universitário Faculdade de Medicina do ABC* reviewer boards (#4426995) and was carried out in accordance with the tenets of the Declaration of Helsinki.

Statistical analyses were performed using Stata/SE Statistical Software, Release 14.0, 2015 (Stata Corp, College Station, Texas, USA). Frequency tables were used for descriptive analyses. Chi-squared tests were applied to compare categorical variables between groups. For all tests, statistical significance was considered when $p < 0.05$.

RESULTS

A total of 28,418 visits were included in the study, with 19,220 from March, 2019 to February, 2020 (pre-pandemic period), and 9,198 from March, 2020 to February, 2021 (pandemic period). These numbers represent a decrease of 52.14% during the Covid-19 pandemic in 2020.

Table 1 shows the profile of individuals who visited the service in the two periods of time analyzed.

Table 1. Participants' demographics

	Pre-pandemic	Pandemic	p-value
Sex			<0.001
Male	9,977 (51.91)	5,003 (54.39)	
Female	9,243 (48.09)	4,195 (45.61)	
Age category, years old			<0.001
0-18	3,275 (17.04)	1,331 (14.47)	
19-59	13,256 (68.97)	6,371 (69.27)	
60 or more	2,689 (13.99)	1,496 (16.26)	
Total	19,220 (100.00)	9,198 (100.00)	

Results expressed as n (%).

Chi-square test indicates a higher frequency of males, lower frequency of patients from zero to 18 years old, and an increased frequency of 60 years old and more during the pandemic when compared to the pre-pandemic period.

Table 2 shows the reason for visit in the two different periods.

There were statistically significant increases on the following cases during the pandemic, when compared to the pre-pandemic period: corneal, eyelid, uvea, trauma,

Table 2. Reason for visiting the eye emergency service

	Pre-Pandemic	Pandemic	Change
Conjunctival disturbances	7,197 (37.45)	1,577 (17.15)	-54.21
Corneal disturbances	3,479 (18.10)	2,221 (24.15)	+33.40
Eyelid disturbances	2,634 (13.70)	3,617 (39.32)	+186.94
Uvea disturbances	544 (2.83)	365 (3.97)	+40.20
Trauma	322 (1.68)	184 (2.00)	+19.40
Retina disturbances	275 (1.43)	405 (4.40)	+207.74
Refraction disturbances	261 (1.36)	18 (0.20)	-85.59
Herpes	214 (1.11)	159 (1.73)	+55.25
Cataracts	167 (0.87)	87 (0.95)	+8.86
Glaucoma	158 (0.82)	126 (1.37)	+66.64
Scleral disturbances	134 (0.70)	113 (1.23)	+76.21
Orbit disturbances	73 (0.38)	42 (0.46)	+20.22
Tear film disturbances	62 (0.32)	15 (0.16)	-49.45
Post-operative visits	615 (3.20)	97 (1.05)	-67.04
Other causes	320 (1.66)	147 (1.60)	-4.01
Non-specific	2,765 (14.39)	25 (0.27)	-98.11
Total	19,920 (100.00)	9,198 (100.00)	

Results expressed as n (%).

retina, herpes, glaucoma, sclera, and orbit disorders. On the other hand, there were statistically significant decreases on the cases of conjunctival disturbance, refraction, tears film, post-operative visits, and non-specific causes (i.e., consultations without ophthalmological alterations that justify them). Figure 1 illustrates these findings.

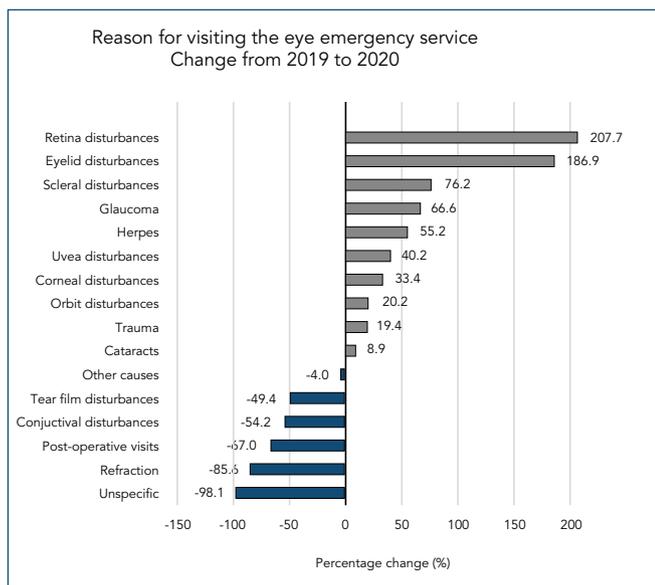


Figure 1. Percentage change of reasons for visiting the emergency service during the pandemic period in comparison to the pre pandemic period. Gray bars indicate increased frequency and blue bars indicate decreased frequency.

DISCUSSION

Our results showed a drastic reduction in the number of patients visiting the emergency eye service care during the first year of the Covid-19 pandemic (52.1%), even in a reference service for emergency eye care in the region

available 24 hours per day, 7 days a week. Different medical specialties have also reported expressive decrease on the attendance of their emergency services.⁽⁹⁻¹¹⁾

Different reports published during the same period of the Covid-19 pandemic have brought data from large hospitals and eye care centers around the world. General emergency visits were reported to have decreased up to 72.5% in India, while ocular emergency consultations were reported to have decreased up to 53.1% in the United Kingdom, very close to the results found in our study.⁽¹²⁻¹⁴⁾ Another study performed in a private service in São Paulo has shown a decrease of 46.2%,⁽¹⁵⁾ slightly lower than our results from a public service.

Data on the population demographic profile showed that, in both periods before and during the pandemic, a higher frequency of men and age group of young adults and adults (19 to 59 years old) was observed. These findings are in accordance with worldwide trends, as discussed by the most recent World Health Organization World Report on Vision that points out that women and elderly individuals do not have the same access as men to ophthalmological services due to cultural issues, financial limitations, and greater obstacles to accessing health services.⁽¹⁶⁾ A slight reduction on the frequency of children was noted probably because they have remained predominantly at home under supervision of adults during the pandemic and, consequently, were less exposed to contamination, accidents, and other risks. On the other hand, elderly patients (> 60 years or more) proportionally increased the demand for attendance, possibly for social reasons as misinformation or lack of discernment about the need to leave the house, unpreparedness for self-care situations during quarantine, or even searching for affection and attention.

The drastic changing in the number of emergency ophthalmic care was mainly due to the reduction of three causes of attendance: nonspecific (-98.1%), postoperative (-67.0%), and conjunctival disorders (-54.1%). Nonspecific causes are consultations without ophthalmological alterations that justify them. In Brazil, labor law states that, upon medical declaration, workers can be absent from work without discount in the remuneration due to illness.⁽¹⁷⁾ In that sense, some patients visit the emergency services with fake symptoms only aiming for these medical declarations that testify their absence from work. The recommendations for social distancing and the new scenario of home-office favored the reduction of those nonspecific cause visits. During the first months of quarantine, any type of care, procedure or surgery of an elective nature (i.e.,

non-emergency) were suspended.⁽⁸⁾ As a result, the number of postoperative consultations was significantly reduced. Conjunctival disorders, especially conjunctivitis, are often contagious and during the pandemic have dropped by half, possibly due to the measures taken to control Covid-19 contamination during the pandemic, such as new hygiene habits and less physical contact.⁽¹⁸⁾ Tear film disturbances (-49.5%) and refractive complaints (-85.6%) also showed a decrease in frequency, as these are chronic pathologies and likely to be postponed.^(19,20)

Contributing to the new emergency eye care visit profiles, severe conditions such as retinal disorders (+202.7%), sclera disorders (+76.2%), orbit disorders (+20.2%), and glaucoma (+66.6%) have significantly increased their rates, indicating that they are perennial conditions, occurring even in the midst of the Covid-19 pandemic, reinforcing the importance of a specialized ophthalmic emergency care service. The retina cases are likely to have shown slight increase on the absolute number of cases also due to the decreased availability of elective consultancies along the period, which might have compromised treatments and proper follow-ups of such condition. Consultations for trauma (+19.4%) have also increased, supposedly related to domestic accidents due to lockdown and need to remain indoors during quarantine.

During the pandemic scenario, the population were daily exposed to unpredictable situations and circumstances, surrounded by moments of extreme anguish, impotence and fear, and emotional distress. In that sense, we observed an increase of frequency of diseases somehow linked to the integrity of immune system, such as eyelids disorders (+186.9% - e.g., hordeolum and chalazion), cornea (+33.4% - e.g., autoimmune and herpetic keratitis), uvea (+40.2% - e.g., infectious and autoimmune uveitis), and herpes (+55.3% - e.g., herpes zoster).⁽²¹⁻²³⁾

This study is limited due to its observational nature since real causality for the observed decline in visits could not be determined. Moreover, our data does not include details on specific conditions such as cases severity and/or adopted treatment. Finally, the results should be interpreted with cautions considering this is a single-center study that does not represent all regions of Brazil, and the impact of the Covid-19 pandemic might vary according to hospital characteristics and geographically location across the country.

CONCLUSION

This study showed a drastic reduction in the number of emergency eye care visits observed during the Covid-19

pandemic period, when compared to the same period in the previous year (pre-pandemic), outlining a new profile of attendance. The main observed changes are explained by the decrease in cases of nonspecific diagnosis, postoperative consultations, and conjunctival affections, probably associated to the new scenario experienced by the population during the pandemic, in which home-office and social distance prevailed. On the other hand, disorders such as retinal alterations, glaucoma, orbit, and trauma have shown proportional increase in their rates, reinforcing that severe conditions remained frequent causes of ophthalmological consultations, regardless of the Covid-19 pandemic. Pathologies possibly correlated with the integrity of the patient's immune and emotional system, such as eyelid affections, uveitis, cornea disturbances, and herpes, have also shown increased rates presumably due to circumstances arising from the pandemic, such as feelings of anguish, helplessness, and fear. Finally, this study reinforces the importance of eye-related emergency services with specialized care.

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