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Original Research Article

Pattern of ocular morbidities during COVID-19 pandemic in a tertiary eye care centre in central India

Tejaswiny Saxena¹, Sooraj Kubrey¹, Aditi Dubey¹, Manisha Singh^{1,*}, Vivek Som¹, Kavita Kumar¹

¹Gandhi Medical College, Bhopal, Madhya Pradesh, India



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ABSTRACT

Purpose: The study was conducted to observe the pattern of ocular morbidities in patients attending the ophthalmology department during the COVID-19 pandemic.

Methodology: A prospective observational study was conducted in a tertiary eye care centre in Central India from 1 January 2020 to 31 December 2020, among a total of 982 patients with ocular manifestations who attended the outpatient department or emergency department. A detailed history was taken and a complete anterior and posterior segment examination was done. The standard investigation and treatment protocol of the institution was followed in all cases.

Result: A total of 982 patients were enrolled in our study with a mean age of 36.42±18.05 years. Male preponderance was noted with an M: F ratio of 2.43. A wide spectrum of ocular manifestations during COVID-19 was observed. The anterior segment was involved in 85.1% and the posterior segment was involved in 14.9% and most common ocular manifestations affecting the anterior segment were noted as computer vision syndrome observed in 18.1% cases, followed by cataracts in 11.4% cases.

Conclusion: Various programs should be implemented to help in reducing the load of visual disability and blindness in the community which is increased after the COVID outbreak. With changing trends in geographical and socio-economical patterns of diseases, similar kinds of a pandemic may occur in the future. There should be formation of flexible government strategies for changing dynamics that can be timely implemented in the future for better management of curable/avoidable diseases.

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1. Introduction

COVID-19 infection, caused by Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was initially detected in Wuhan China in late 2019, but its spread was observed rapidly across the globe.¹ The World Health Organization declared this infection a Pandemic on 11th March 2020.² The mortality rate was high particularly in severe and critical cases in presence of certain risk factors such as advanced age (>60 years), and individuals with comorbidities such as diabetes, hypertension, renal

pathology, obesity, chronic liver disease, and cardiovascular disease.³ Further, all the routine services were shut down temporarily due to a nationwide lockdown as a result of the public health strategy for containing the infection. This resulted in a delay in care seeking or poor utilization of services for non-COVID diseases. This resulted in an increase in morbidity and mortality due to non-COVID illnesses.⁴

The Pandemic affected the healthcare system worldwide hindering the continuum of treatment of chronic disease patients. Overall, the data regarding ocular manifestations and pattern of ocular morbidities in COVID-19 patients is widely explored but the change in the spectrum of ocular

* Corresponding author.

E-mail address: bj.manisha.ms@gmail.com (M. Singh).

manifestations as a result of a pandemic has been paid less attention. The present study was therefore conducted to observe the pattern of ocular morbidities in patients attending ophthalmology clinics during the pandemic.

2. Methodology

A prospective observational study was conducted in a tertiary eye care centre in Central India for the duration of 1 year from 1 January 2020 to 31 December 2020 adhering to the tenets of the Declaration of Helsinki. In this study, a total of 982 patients with ocular manifestations who attended the outpatient department or emergency department during the study period were included. A total of 357 female patients and 625 male patients were enrolled in this study. The demographic details like age, gender, socioeconomic status, literacy, and occupation of all the cases were recorded. All cases were treated as infectious and appropriate personal protective devices were used during examination and treating them. The use of shields was done while using slit lamps and other examining devices. The examination room and the surfaces were cleaned with sodium hypochlorite solution every 4 hours.

A thorough history of these cases was taken and an assessment of visual acuity was done.

Complete anterior and posterior segment examination was done. The standard investigations and treatment protocol of the institution for various ocular morbidities were followed in all cases. If any surgical procedure was anticipated, then AIOS guidelines were followed. In Operation theatre, procedures were done after donning the PPE suits. Cases with suspected COVID-19 infection were subjected to test and if tested COVID-19 positive, Institutional SOP was followed during treatment. The sterilization and disinfection of instruments used were done by using appropriate recommended measures to prevent the patient-to-patient transmission of any communicable diseases after each use.

2.1. Statistical analysis

Data was compiled via MS. Excel and analysis was done with the help of IBM SPSS software version 20 (IBM Corp. Illinois, Chicago). Qualitative data were compared by Chi-square and Fischer-exact test and quantitative data was compared by ANOVA one-way test. Non-parametric tests were applied wherever the sample size was less. A $p \leq 0.05$ was considered statistically significant.

3. Results

In the present prospective observational study total of 982 patients were enrolled study with a mean age of 36.42 ± 18.05 years.

In the present study majority of the patients belonged to the 21- 40 year of age group (41.2%) with a mean age

Table 1: Distribution of patients according to baseline variables

Baseline variables	Frequency (n=982)	Percentage	
Age (years)	≤20	210	21.4%
	21-40	404	41.1%
	41-60	274	27.9%
	>60	94	9.6%
Sex	Male	625	63.6%
	Female	357	36.4%
Containment area	Yes	206	20.9%
	No	776	79.1%
Recruitment from	OPD	894	91.0%
	Emergency	88	9.0%

of 36.42 ± 18.05 years. Male preponderance with an M: F ratio of 1.7 was noted in the present study. The majority of patients were recruited from OPD (91%) and 20.9% of patients resided in the COVID containment zone. (Table 1)

Table 2: Distribution according to clinical features

Clinical features	Frequency (n=982)	Percentage	
History of cough/ cold	Yes	14	1.4%
	No	968	98.6%
Temperature	Afebrile	976	99.4%
	Febrile	6	0.6%

Previous history of cough or cold was noted in 1.4% cases and about 0.6% cases were febrile. (Table 2)

The most common ocular manifestation affecting the anterior segment was computer vision syndrome observed in 18.1% of cases, followed by cataracts (11.4%). Severe manifestations such as open-angle glaucoma and Neoplasm were noted in 1% and 1.2% cases respectively.

The posterior segment was involved in 147 cases and Retinopathy of prematurity was the most common condition in our study.

4. Discussion

In our tertiary eye care centre, patients seek care for a wide spectrum of ocular complaints. The routine services were hampered across the world and all the health care services were diverted towards the care of COVID-19-positive patients. However, routine and emergency ophthalmic services were at a standstill after the nationwide lockdown, and a majority of the centres were converted into dedicated COVID care centres. In this study, we analyzed the ocular manifestations among the patients seeking care at our eye care centre during the study period. The majority of our patients belonged to the active age group with more than 65% of patients belonging to 20 to 60 years of age. Maximum cases seeking care in our study during the pandemic were males (63.6%) with an M: F ratio of 1.7. This could be attributed to the panic regarding the pandemic

Table 3: Spectrum of ocular manifestations during COVID-19 pandemic (Anterior segment)

	Diagnosis	Frequency	Percentage
Eyelids	Ptosis	6	0.6%
	Chalazion	16	1.6%
	Blepharitis	22	2.3%
	Lid Swelling	12	1.2%
	Lid Tear	9	0.9%
Lacrimal sac	Epiphora	12	1.2%
	Acute Dacryocystitis	9	0.9%
	Chronic Dacryocystitis	17	1.7%
Conjunctiva	NLD Blockage Allergic	1	0.1%
	Conjunctivitis	35	3.6%
	Conjunctival Cyst	1	0.1%
	Conjunctivitis	71	4.6%
	Vernal	26	2.7%
	Keratoconjunctivitis		
	Corneal Tear	1	0.1%
Cornea	Corneal Foreign Body	59	6.0%
	Corneal Ulcer	24	2.4%
	Peripheral	1	0.1%
	Ulcerative Keratitis		
	Herpes Zoster Ophthalmicus	10	1.0%
Glaucoma	Fungal Keratitis	3	0.3%
	Glaucoma Neovascular	5	0.5%
	Lens induced Glaucoma	1	0.1%
	Glaucoma Open Angle	10	1.0%
	Acute Anterior Uveitis	3	0.3%
Uvea	Chronic Anterior Uveitis	1	0.1%
	Congenital Cataract	3	0.3%
	Cataract	112	11.4%
Lens	Posterior	3	0.3%
	Capsular Opacity		
	Traumatic Cataract	1	0.1%
	Convergence insufficiency	9	0.9%
Other	Computer vision syndrome	178	18.1%
	Refractive Error	51	5.19%
Total	Dry eye	23	2.3%
		835	85.1%

Table 4: Spectrum of ocular manifestations during pandemic (Posterior segment)

Posterior segment	Diagnosis	Frequency	Percentage
Retina	Retinal Detachment	5	0.5%
	Rhegmatogenous Retinal Detachment	6	0.6%
	Tractional Retinal Detachment	3	0.3%
	Retinopathy of Prematurity	29	3.0%
	Retrolbulbar Neuritis	5	0.5%
	Traumatic Optic Neuropathy	1	0.1%
	Posterior Choroiditis	14	1.4%
	Vitreoretinal Degeneration	5	0.5%
	Papilloedema	10	1.0%
	Branch Retinal Vein Occlusion	1	0.1%
	Central Retinal Artery Occlusion	1	0.1%
	Central Serous Chorioretinopathy	1	0.1%
	Mild to moderate NPDR	10	1.0%
	Severe NPDR	12	1.2%
	Proliferative Diabetic Retinopathy	14	1.4%
	Advanced Diabetic Retinopathy	8	0.8%
	Hypertensive Retinopathy	17	1.7%
Total		147	14.9%

among elderly patients as elderly cases, with comorbid conditions were considered at high risk of developing the severe COVID-19 infection. (Table 1)

Our study findings were concordant with the findings of the study conducted by Alsaedi et al, in which the majority of patients belonged to the age group of 18–30 years (57.5%) and 71.9% of the cases were male patients in their study.⁵ Similarly, the mean age of patients in a study conducted by Kumar et al. was 39.46 ± 17.63 years and 53.28% of the cases were male patients in their study.⁶ More than 50% of cases in a study conducted by Sarkar et al. belonged to 19 to 45 years.⁷

In our study, the history of cough/ cold and fever during the past week was documented in 1.4% of the cases. Thus, the majority of cases in our study were presumed to be non-COVID cases, however, the confirmatory test was not done.

(Table 2)

In the present study, anterior segment involvement was noted in 85.1% of cases whereas posterior segment findings were noted in 14.9% of cases.

Among anterior segment findings, common findings were computer vision syndrome (23.1%) and cataract (11.4%) whereas Retinopathy of prematurity was the most common condition in the posterior segment (3%). Overall, the conditions of the eye ranges from mild manifestations to severe manifestations endangering the vision. The manifestations may be directly related to COVID itself or were aggravated due to delay in seeking care as a result of the nationwide lockdown. (Table 3)

In the present study, we found a reduction in patients reporting to the department with the refractive error. We also noted a decrease in the number of patients for cataract surgeries (11.4%) and glaucoma (1.6%) follow-up as compared to pre COVID era. This can be attributed to the non-availability of medications and financial difficulties. (Table 3)

Parul C Gupta et al reported in their study that in 2020, they performed only 33% of the total expected cataract surgeries, and the remaining 67% of cases constituted the fixed backlog.⁸ G N Subathra et al demonstrated in their study that 88.21% of glaucoma patients did not attend the scheduled appointment during the lockdown in a tertiary eye care centre and 57.3% of the patients were noted to be non-adherent to their anti-glaucoma medications. Major barriers to a glaucoma follow-up visit during the pandemic were transport restrictions and financial difficulties.⁹

The incidence of Computer vision syndrome (18.1%) was found to be more during the study period which was found to be statistically significant that can be attributed to online classes during the pandemic. Since the declaration of the lockdown due to COVID 19, the usage of digital devices has gone up across the globe, resulting in a challenge for the visual systems of all ages. (Table 3)

The study conducted by Fayiqah Ahamed Bahkir et al reported that 93.6% (381/407) of participants reported an increase in the usage of digital devices after the lockdown was declared that accounted for ocular surface problems and digital eye strain.¹⁰

In the present study, we found a statistically significant difference in the mean number of screened babies(3%) in 2020 as compared to 2019 (P= 0.002) and more number of severe stages were noted as major barriers for glaucoma follow-up visits during the pandemic were transport restrictions and financial difficulties. (Table 4)

Sarkar S et al have also reported similar findings of decreased number of screened babies in 2020 that was found to be statistically significant (P= 0.016).¹¹ Delayed screening and intervention in premature babies can lead to irreversible blindness.¹² Due to the COVID-19 pandemic, the number of babies screened and diagnosed for ROP drastically reduced in India, which can be attributed to a

severe presentation of ROP.¹³

To avoid blindness in these infants telemedicine network can be used for ROP screening during the COVID-19 pandemic which would be safe, effective, and feasible as supported by Zheng Guo et al in their study.¹⁴

A sudden fall in the number of cases with routine problems was noted because of lack of public transportation, ignorance among the population, fear of contracting the COVID-19 infection, and several restrictions and protocols in hospitals during the nationwide lockdown contributed to the increased burden of the severe form of diseases.¹⁴

We have assessed the pattern of ocular manifestation during the COVID pandemic irrespective of the positive status of the patients as COVID 19 had both direct as well as indirect effects on the overall health of the patients and ocular manifestations are no exception. However, our study had certain limitations, the ocular manifestations as a result of COVID itself or secondary to the pandemic could not be separately assessed.

5. Conclusion

Various programs should be implemented to help in reducing the load of visual disability and blindness in the community which is increased after the COVID outbreak.

With changing trends in the geographical and socio-economical pattern of diseases, a similar kind of pandemic may occur in the future. There should be the formation of flexible government strategies for changing dynamics that can be timely implemented in the future for better management of curable/avoidable diseases.

6. Source of Funding

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7. Conflict of Interest


None declared.

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Author biography

Tejaswiny Saxena, Resident  <https://orcid.org/0000-0002-2830-2954>

Sooraj Kubrey, Associate Professor  <https://orcid.org/0000-0002-0155-3104>

Aditi Dubey, Associate Professor(D)  <https://orcid.org/0000-0002-1030-1347>

Manisha Singh, Senior Resident

Vivek Som, Professor(D)

Kavita Kumar, Professor & HOD

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