



OPHTHALMOLOGICAL MANIFESTATIONS IN POST COVID-19 PATIENTS: A CROSS SECTIONAL STUDY

Ophthalmology

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ABSTRACT

Background: Though COVID 19 essentially is a respiratory tract illness, it has been noticed to involve other systems too including eye. Some COVID patients continue to experience symptoms even after their recovery from the acute phase known as “long haulers” and the condition is termed as “Post COVID syndrome”. The present study is done to describe and categorise ophthalmological findings in COVID-19 survivors. **Materials And Method:** A cross sectional study was conducted in the Department of Ophthalmology, RIMS, Imphal from December 2021 to April 2022 including 52 post COVID- 19 patients attending RIMS Hospital Ophthalmology OPD/Emergency service with some complaints related to eye satisfying all the inclusion criteria. Proper history regarding COVID-19 phase and recent ocular symptom has been enquired from each patient. A comprehensive ophthalmological examination was done to analyze ophthalmological complaints in patients recovered from COVID- 19 and to assess the post Covid-19 patients in terms of best corrected visual acuity, Schirmer's test 1, Intraocular pressure, anterior segment and posterior segment findings. **Results:** Mean age of the patients was 56.87 years with diabetes mellitus being the most common comorbidity. Most of them presented within 30-60 days of appearance of COVID symptom. Majority were diagnosed to have cataract, dry eye and diabetic retinopathy. **Conclusion:** Our study emphasizes on the need of thorough ophthalmological assessment and screening in post-COVID – 19 patients and the implication of medications used in the treatment of COVID.

KEYWORDS

Covid-19, long haulers, Ophthalmological manifestations

INTRODUCTION

In December 2019, the world witnessed the spread of a new corona virus known as Severe acute respiratory syndrome corona virus 2 (SARS- CoV-2). The disease caused by it was named 'COVID-19' which eventually led to a global pandemic . Respiratory droplets are main route of transmission for the novel corona virus. Transmission via conjunctival route has also been suggested but this is controversial.¹

Though COVID 19 essentially is a respiratory tract illness, it has been noticed to involve other systems too including eye. In the acute phase of the disease, a significant number of patients have shown the features of ocular surface impairment (red eye, foreign body sensation, blurring of vision, tearing of eyes, itching etc)² as well as posterior segment involvement (microhaemorrhages, flame shaped haemorrhages, cotton wool spots).³ Red eye is the most commonly reported ocular symptoms among COVID- 19 patients.²

Some COVID patients continue to experience symptoms even after their recovery from the acute phase known as “long haulers” and the condition is termed as “Post COVID syndrome”. But there is no agreement on definition of post COVID syndrome and time frame for defining post-COVID symptoms. Long haulers report symptoms involving different systems i.e. neurocognitive, autonomic, gastrointestinal, respiratory, musculoskeletal, psychological.⁴ Hence, to properly understand the sequelae of covid 19, a multidisciplinary approach is a must.

Different literatures and news reports have revealed higher incidence of ocular symptoms in post covid patients. Even in view of the ocular side effects of pharmacotherapy used in COVID-19, rise of certain eye conditions was predicted beforehand.⁵ But there is still a lack of clinical studies about the ocular signs and symptoms persisting after COVID. The purpose of this study is therefore to look for such ocular manifestations in patients surviving COVID-19.

AIMS AND OBJECTS

The purpose of the present study is

1) To analyze Ophthalmological complaints in patients recovered from

COVID- 19

2) To assess the post Covid-19 patients in terms of best corrected visual acuity, Schirmer's test 1, Intraocular pressure, anterior segment and posterior segment findings.

MATERIALS AND METHODS

Study Design: Cross-sectional study

Study Setting: Department of Ophthalmology, Regional Institute of Medical Sciences, Imphal, Manipur

Study Duration: The study was conducted between December 2021 to April 2022 over a period of five months.

Study Population: Post COVID- 19 patients attending RIMS Hospital Ophthalmology OPD/Emergency service with some complaints related to eye satisfying all the inclusion criteria were enrolled in the study.

Inclusion Criteria:

1. Positive diagnosis of SARS-CoV-2 with reverse transcriptase polymerase chain reaction(RT-PCR) test and subsequent recovery confirmed by repeat testing
2. Time interval between COVID-19 disease's first symptom and the eye examination of minimum 30 days
3. Age group of 18-80 years
4. Ocular symptoms appearing after the SARS-CoV-2 infection
5. Patients willing to take part in the study

Exclusion Criteria:

1. Patients diagnosed by other tests (TRUNAT/CBNAAT/Rapid Antigen test)
2. Age less than 18 years
3. Asymptomatic COVID-19 patients
4. Pregnant woman
5. Patients sustaining ocular trauma

Sample Size:

Every post COVID-19 patients attending RIMS hospital eye

OPD/emergency from December 2021 to April 2022 fulfilling inclusion and exclusion criteria were enrolled in the study.

Procedure:

Demographic data were recorded for each patient to include parameters like age, sex and comorbidities. The date on which he or she had the first symptom consistent with COVID-19 was noted down. We also noted the date when they tested positive for the infection by RT-PCR of nasopharyngeal swab. All of them were classified into three groups i.e. mild, moderate and severe depending on the history of COVID-19 systemic manifestations, treatment and therapeutic intervention they received.

The patients were enquired about the presenting ocular symptoms. Then we evaluated them with a complete ophthalmological examination. Best corrected visual acuity was examined by Snellens chart. Dry eye assessment was done by Schirmer -1 test. Intraocular pressure was measured by Goldmann tonometer. We also performed slit lamp biomicroscopy, indirect ophthalmoscopy and OCT for complete anterior segment and posterior segment assessment.

Statistical Analysis:

The parameters and patient data were recorded and entered in Microsoft excel sheet(Microsoft office 2007 professional).Statistical package for social sciences (SPSS) version 21 (IBM Corp, Armonk, NY) was used for statistical analysis.

Approval of Research Ethics Board

Approval from the Research Ethics Board of RIMS, Imphal was obtained before data collection. Written informed consent of the patient who fulfilled the inclusion criteria was obtained. Collected data were kept password protected. Only the investigators had access to the data.

OBSERVATION AND RESULTS

Age Distribution:

Mean age of patients was 56.87 years with a standard deviation of 12.99. Minimum age was 23 years while maximum was 79 years.

Gender Distribution:

Of the total 52 patients, 58% were male while 42% were female.

Duration Since First Symptom Of COVID-19

The minimum time interval which was observed from first symptom of COVID-19 to presentation in the Ophthalmology department was 32 days and the maximum was 105 days the mean being 58 ± 20.13 days.35 cases presented in the 2nd month post-COVID and 9 and 8 cases presented in the 3rd and 4th month respectively.

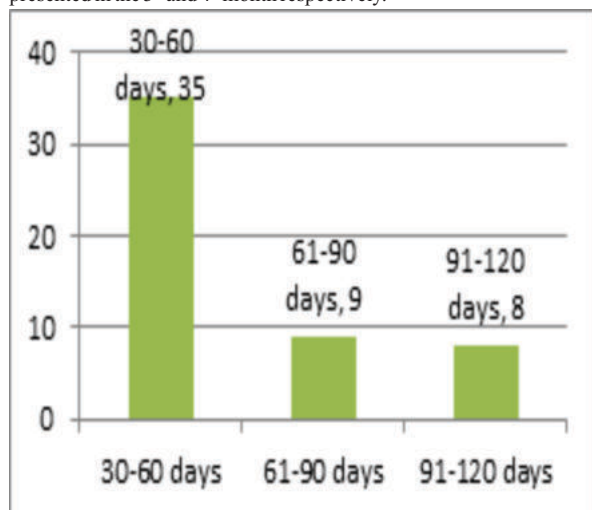


Figure-1 Duration Since First Symptom Of COVID-19

Comorbidities:

41 patients were diagnosed cases of Diabetes mellitus.26 patients were Chronic Kidney Disease patients while number of hypertensive patients were 22.Other comorbidities like dyslipidemia, Hypothyroidism, asthma, COPD, cardiovascular diseases and immunocompromised state etc were also noted.

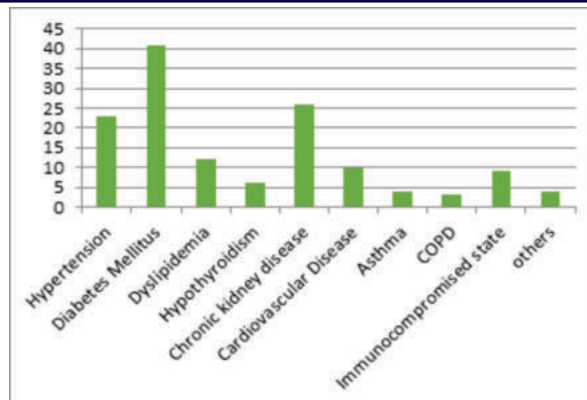


Figure-2 Distribution Of Comorbidities

Classification Of COVID-19 Disease:

14% suffered from mild form of COVID-19 whereas 68% and 18% had moderate and severe form of the disease respectively.

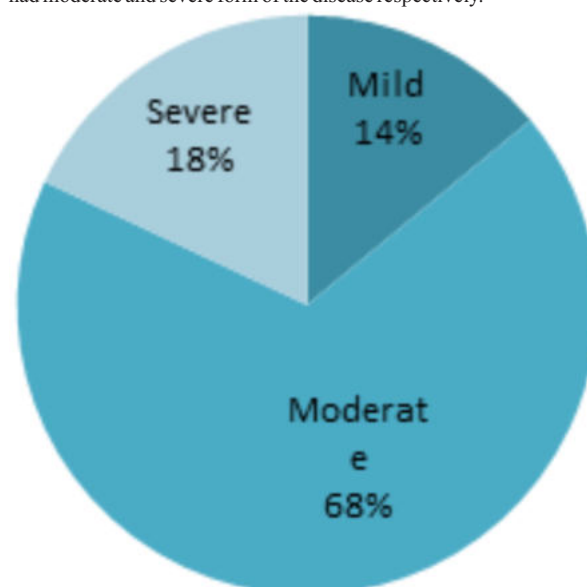


Figure-3 Classification Of COVID-19 Disease

Treatment Received For COVID-19:

Antivirals and steroids were the commonly advised treatment modality in the majority of the patients. A few patients had Hydroxychloroquine too.

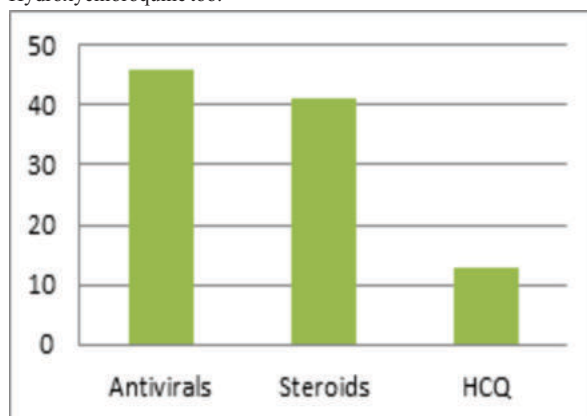


Figure-4 Treatment Received For COVID-19

Distribution Of Symptoms:

Majority (61.50%) of the patients presented with blurring of vision. The second most common symptom noticed was watering of eyes. Other common symptoms were itching of eyes, redness of eyes, foreign body sensation, intolerance to light etc.

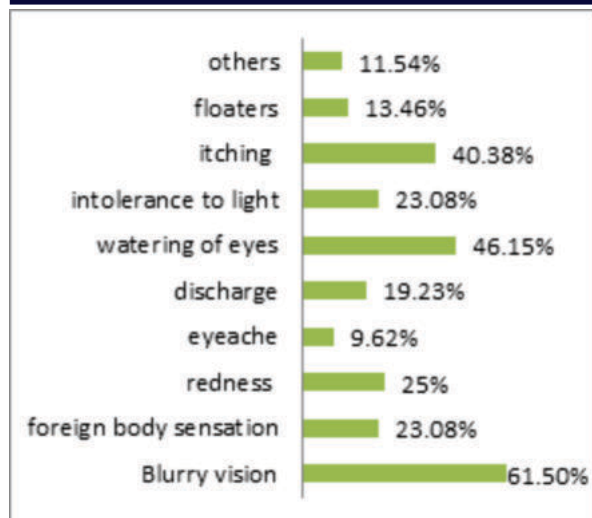


Figure-5 Distribution Of Symptoms

Visual Impairment Level:

29% cases had no visual impairment, 50% had visual impairment, 15% had severe visual impairment while 6% fell into the category of blindness according to WHO criteria.

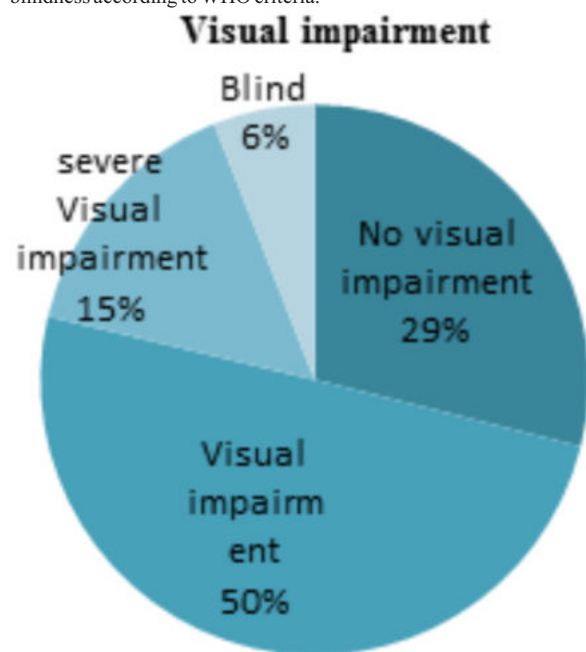


Figure-6 Visual Impairment Level

Presence Of Dry Eye:

A vast majority of the patients were diagnosed to have dry eye by Schirmer I test.

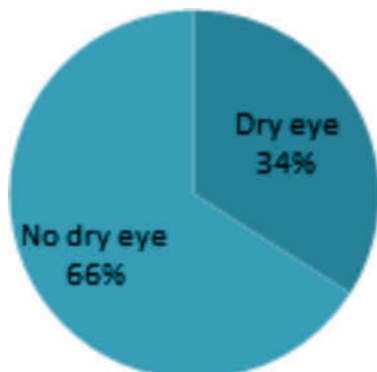


Figure-7 Presence Of Dry Eye

Presence Of High Intraocular Pressure:

88% had their intraocular pressure in the normal range while 8% had high IOP.

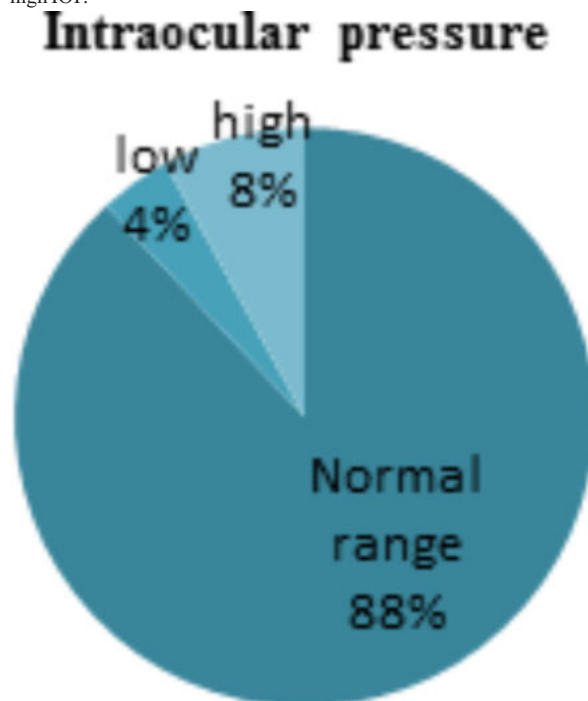


Figure-8 Intraocular Pressure

Anterior Segment And Posterior Segment Assessment:

On anterior segment assessment, among total 52 patients 10 cases of subconjunctival haemorrhages were seen. Episcleritis was seen in 2 patients and acute anterior uveitis were noticed in 8 cases. Cataract of various grades were found in 21 patients.

On posterior segment assessment, Nonproliferative diabetic retinopathy was a common finding seen in 15 patients. Both new onset and worsening of previously diagnosed diabetic retinopathy were noticed. Proliferative diabetic retinopathy was seen in 5 patients of which 3 had macular edema also. 3 patients presented with Central Retinal vein occlusion.

Three cases of rhino-orbito-cerebral mucormycosis were encountered. All of them had diabetes in common and had severe COVID-19 infection.

DISCUSSION

The mean age of the patients was found to be 56.87 years. So, most of the patients belonged to the senile group. Male patients were slightly higher in number than females. Most of the patients presented with some sort of eye problem on the 2nd month (5th week to 8th week) and 3rd month (9th week to 12th week) of post-COVID time. This can be classified as 'Acute Post-COVID symptoms'.⁴ Only a few cases presented after the completion of 3 months which can be regarded as 'Long Post-COVID symptoms'. Majority of the patients had some comorbidities like Diabetes, Hypertension, Chronic Kidney Disease which attributed to the development of ophthalmological manifestation also. Percentage of moderate degree COVID patients were higher in our study who were treated with antivirals and steroids mostly. Severe cases had ICU admission too. These treatment modalities had their own sets of adverse effect and complications as far as eye is concerned.

The most common symptom encountered in our study was blurry vision followed by watering of eyes. Half of the patients had visual impairment whereas few patients presented with severe visual impairment and blindness too. Kamal M et al⁶ in their cross sectional study found that 17.1% of the study population of post-COVID patients were suffering from blurred vision. They attributed this finding to the use of hydroxychloroquine as a treatment of the disease. In our study, blurring of vision can be attributed to presence of different ocular problems starting from refractive error to diabetic retinopathy

findings. Watering of eyes can be explained by the presence of dry eye in 34% of the total patients. Similar results were found in the study done by Gambini G et al⁷ where Ocular Surface Disease Index Questionnaire (OSDI) score was higher in the post-COVID-19 group and both quantitative and qualitative analysis revealed presence of dry eye in those patients.

Most of the patients in our study had intraocular pressure in the normal range. Presence of high IOP in a small percentage may be because of the use of steroids for treating COVID-19.

Many of the patients were diagnosed to have cataracts of various grades. Widespread steroid use can be a reason behind the rise of cataract cases in Post-COVID-19 patients. Diabetic retinopathy was also a predominant disease present in our study population. The results were similar to the study done by Costa I F et al⁸ where 15.6% had diabetic retinopathy. Physical inactivity and sedentary lifestyle during lockdown or isolation can be blamed for this.

Three cases of rhino-orbito-cerebral mucormycosis were seen in the study population who had diabetes and were treated with steroids and antivirals in the ICU during active COVID-19 stage. In the study done by Sharma S et al⁹ nineteen patients of mucormycosis were encountered who were in the recovery phase of COVID-19.

CONCLUSION

In our study, mostly patients of senile age group with comorbidities like DM and hypertension presented on the 2nd and 3rd month of post-COVID 19 phase with blurring of vision, dry eye symptoms. Cataract and diabetic retinopathy were quite common in the study population. Rhino-orbito-cerebral mucormycosis was also diagnosed in few patients. All these ophthalmological manifestations can be explained by the presence of comorbidities and the adverse effect of medications they received during COVID-19.

Our study sheds some light on the unexplored potential sequelae of SARS-CoV-2 infection and emphasizes on the need for comprehensive ophthalmological assessment in post-COVID-19 patients. Implications of therapies used to treat COVID-19 patients should be kept in mind too.

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Disclosures And Conflict Of Interest: None

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