



A STUDY ON THE OCULAR MANIFESTATIONS IN PATIENTS FOLLOWING COVID-19 INFECTION

Ophthalmology

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ABSTRACT

Background And Objective: The objective of this study was to evaluate ocular manifestations in Post COVID-19 patients. **Materials And Methods:** This study was conducted at the Department of Ophthalmology, Chalmeda Ananda Rao Institute of Medical Sciences from October 2020 to April 2021. 200 patients with the history of COVID-19 infection were included in the study. Detailed history was taken, slit lamp examination and fundoscopy was done for all patients, relevant investigations like Optical coherence Tomography, Fundus Fluorescein Angiography were done. **Results:** 23 out of 200 (122 male and 78 female) patients had ocular manifestations, 15 patients had viral conjunctivitis, 3 patients had episcleritis, 2 patients had central serous chorioretinopathy (CSCR), 1 patient had Central retinal artery occlusion (CRAO), 2 patients were Rhino-Orbito-Cerebral Mucormycosis (ROCM) suspects. **Conclusion:** Study emphasises on ocular manifestations associated with COVID 19 infection and its sequelae. As these patients presented with an association with COVID 19 infection (either during or recovery) ophthalmologists should be watchful and screen for such entities.

KEYWORDS

Coronavirus disease 2019 (COVID-19), episcleritis, viral conjunctivitis, central retinal artery occlusion (CRAO), central serous chorioretinopathy (CSCR), Rhino-Orbito-Cerebral Mucormycosis (ROCM).

INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the pathogen responsible for coronavirus disease 2019 (COVID-19), has caused morbidity and mortality at an unprecedented scale globally. As the population of patients recovering from COVID-19 grows, it is paramount to establish an understanding of the healthcare issues surrounding them. Apart from severe systemic disease, various ophthalmic manifestations have been reported during and following the infection of SARS-CoV-2.

The aim of this study was to study ocular manifestations in patients following COVID-19 infection.

MATERIALS AND METHODS

This study was conducted at the Department of Ophthalmology, Chalmeda Ananda Rao Institute of Medical Sciences from October 2020 to April 2021. Permission was obtained from ethical committee of the institute. An informed consent was obtained from subjects willing to participate in the study. A total of 200 patients aged between 18 and 60 with a history of Covid-19 infection with in a span of 8 weeks have participated in the study.

Inclusion Criteria:

All patients with previous history of COVID 19 infection within the age group of 18-60 years

Exclusion Criteria:

Media opacities which preclude fundus examination, Patients with pre-existing ocular disorders

All patients had positive real-time reverse transcription-polymerase chain reaction (RT-PCR) for SARS-CoV-2 from a nasopharyngeal swab during the active phase of the COVID-19 infection. Relevant ocular history and systemic history was taken. All subjects underwent baseline examination to rule out any abnormality in both the eyes. Unaided, aided and pinhole visual acuity was recorded for distance with Snellen's distant visual acuity chart at 6 meters for ambulatory patients. Refraction was performed objectively and subjectively. Slit lamp evaluation was done to rule out any anterior segment abnormality. Fundus examination was done. Relevant ocular investigations like Optical Coherence Tomography (OCT), Humphrey visual field analysis (HVF), Fundus fluorescein Angiography (FFA) were done. All relevant systemic and radiological investigations were done

RESULTS

In this study, 200 patients were examined for the evaluation of ocular

manifestations following COVID-19 infection and below assessments were made.

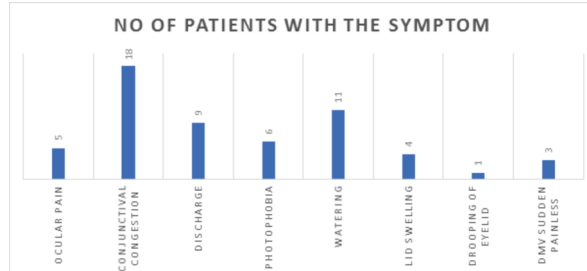
Table 1: Age And Gender Distribution

Age in years	No of patients	Percentage 23/100	No of males	No of females
18-30	6	3%	4	2
30-40	7	3.5%	4	3
40-50	6	3%	4	2
50-60	4	2%	2	2
Total	23	11.5%	14	9

Patients of all age groups are almost equally affected, there was a slight male preponderance

Table 2: Symptoms

SYMPTOM	No of patients with the symptom
OCULAR PAIN	5
CONJUNCTIVAL CONGESTION	18
DISCHARGE	9
PHOTOPHOBIA	6
WATERING	11
LID SWELLING	4
DROOPING OF EYELID	1
DMV sudden painless	3

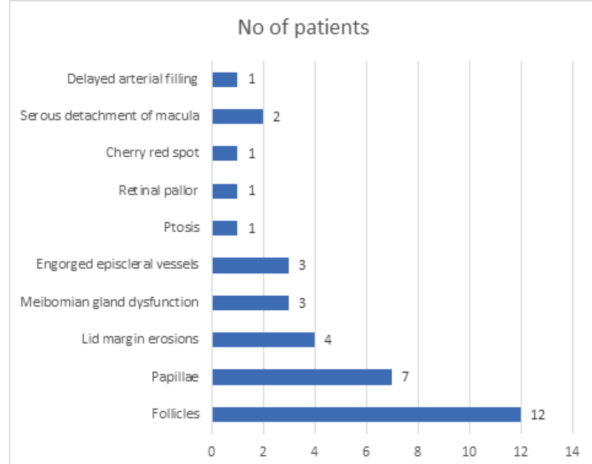


Most common symptom of patients was conjunctival congestion

Table 3: Signs

SIGN	No of patients
Follicles	12
Papillae	7
Lid margin erosions	4

Meibomian gland dysfunction	3
Engorged episcleral vessels	3
Ptosis	1
Retinal pallor	1
Cherry red spot	1
Serous detachment of macula	2
Delayed arterial filling	1



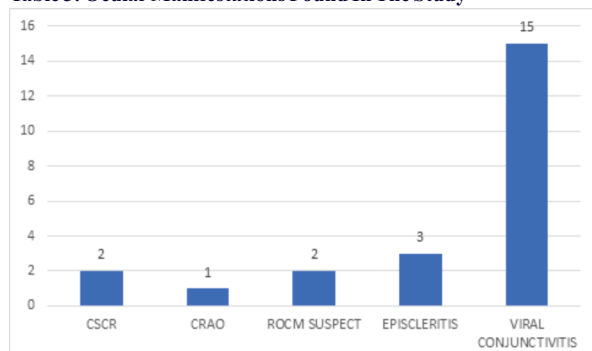
The most common signs elicited were follicles and papillae

Table 4: Associated Comorbidities In Patients With Ocular Manifestations

COMORBIDITY	No of Patients
HYPERTENSION	14
DIABETES MELLITUS	11
CVA	5
CAD	3
RHEUMATOID ARTHRITIS	1
OBESITY	7

Most of the patients with ocular manifestations were Hypertensive (60.8%) and Diabetic (47.8%)

Table 5: Ocular Manifestations Found In The Study



2 patients had CSCR, 1 patient had CRAO, 2 patients were ROCM suspects, 3 patients were diagnosed with episcleritis, 15 patients were diagnosed with conjunctivitis

DISCUSSION

In our study 23(11.5%) out of 200 patients had Covid-19 related manifestations.

Age And Gender Distribution:

Patients in all age group are almost equally affected, the study revealed a slight Male preponderance with a male to female ratio of 1.56:1 which is lesser than that of study conducted by Sindhuja *et al.*[1]

Symptoms:

Most common symptom of patients was conjunctival congestion which is similar to the study conducted by Sindhuja *et al.*[1] and chen *et al.*[2]

Signs:

Most common signs elicited were follicles and papillae which is

similar to the study conducted by Sindhuja *et al.*[1] and Nasiri *et al.*[4]

Associated Comorbidities In Patients With Ocular Manifestations:

Most of the patients with ocular manifestations were Hypertensive(60.8%) and Diabetic(47.8%) which is similar to study done by Sanyaolu A, Okorie C, Marinkovic A, *et al.*[3]

Types Of Ocular Manifestations Found In The Study:

2 patients had CSCR, 1 patient had CRAO, 2 patients were ROCM suspects, 15 patients had viral conjunctivitis, 3 patients had episcleritis similar to the study conducted by Sindhuja *et al.*[1] and Nasiri *et al.*[4]

CONCLUSION

Follicular conjunctivitis manifesting as conjunctival congestion is common. It is one of the major ocular manifestations in patients following COVID-19 infection even with mild disease. CSCR is a recognized complication of steroid use and hence its association with COVID-19 is anticipated, numerous other risk factors and associations with CSCR have been reported (systemic hypertension and psychological stress). Rhino Orbito Cerebral Mucormycosis is one of the most dreaded complications of non-judicious steroid use in management of covid 19. Patients with Covid-19 infection are in a procoagulant state with raised D-Dimer, PT, aPTT, IL-6 and cytokines resulting in vascular occlusions like CRAO. Pathophysiology of episcleritis in the context of Covid-19 may include immunovascular factors and/or coagulation disorders.

Study emphasizes on ocular manifestations associated with COVID 19 infection and its sequelae. As these patients presented with an association with COVID-19 infection (either during or recovery) ophthalmologists should be watchful and screen for such entities to prevent further complications.

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