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Post Covid -19 manifestations among patients attending Outpatient department of Ophthalmology in a tertiary care teaching institute Puducherry

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Abstract

Introduction: Post-COVID condition - people affected by SARS-CoV-2 with symptoms which persists after the acute phase. There are several studies on ocular manifestations during COVID-19 infection but only few studies are available regarding ocular manifestations among post- covid patients. Hence, the study was undertaken.

Objectives: To determine the ocular manifestations in patients recovered from COVID-19 infections and to compare the ocular manifestations in home quarantine and hospitalized COVID-19 recovered patients.

Methods: A Cross-sectional study was conducted in tertiary care teaching hospital from September 2021 to November 2021 on 70 Patients recovered from COVID 19 infection. After taking consent, the data was collected regarding patient details and examination such as Visual acuity, Colour vision, Anterior segment, Intra- Ocular Pressure, Fundus examination and Schirmer's test were carried out. Data was entered in Microsoft- Excel and analysed using SPSS version 20.0**.**

Result: Ocular involvement in SARS CoV-2 recovered patients was 56%. Among these, 14% of patients developed conjunctivitis and Dry eye.

Conclusion: Ocular involvement in SARS CoV-2 recovered patients was 56%. Dry eye and conjunctivitis are the common post COVID ocular manifestations. There was no significant association found between ocular manifestation with co-morbidity, type of quarantine and severity of disease.

Keywords: Covid-19, Ocular manifestation, Post Covid-19 Syndrome, Conjunctivitis, Fundus examination

Introduction

The outbreak of coronavirus disease 2019 (COVID-19) started in Wuhan, China in December 2019 and rapidly spread globally. It was declared as a public health emergency of international concern in January 2020 and as a pandemic in March 2020 by the World Health Organization (WHO). The causative pathogen of this potentially fatal disease has been named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which is a novel enveloped Beta coronavirus, a member of the Coronaviridae family with a positive sense single stranded RNA genome.[1] The common clinical manifestations include fever, cough, fatigue, sore throat, headache and in severe cases it can present as acute respiratory distress syndrome, multiple organ failure due to cytokine storm and death.[2]

Post-COVID syndrome (PCS) or post-COVID condition has been proposed, people affected by SARS-CoV-2 with symptoms that persist after the acute phase and defined PCS as extending beyond three weeks from the onset of first symptoms and chronic COVID-19 as extending beyond 12 weeks. [3,4]

While diagnostic and therapeutic efforts have been focused on respiratory complications of the disease, several ocular implications have also emerged. SARS-CoV-2 RNA has been found in tears of the infected patients, and reports suggest that the ocular surface could serve as a portal of entry and a reservoir for viral transmission.[5] Clinically, COVID-19 has been associated with mild conjunctivitis (most common ocular manifestations in COVID), which can be the first and only symptom of the disease. Subtle retinal changes like hyper reflective lesions in the inner layers on optical coherence tomography (OCT), cotton-wool spots, and microhemorrhages have also been reported. In addition, COVID-19 has been associated with an increased incidence of systemic disease like diabetes mellitus which are particularly relevant for ophthalmologists due to their potentially severe ocular manifestations. Intensive care unit patients, due to risk factors like invasive mechanical ventilation, prone position, and multiresistant bacterial exposure, may develop ocular complications like ocular surface disorders.[6]

Study rationale

There are several studies on ocular manifestations during COVID-19 infection but only few studies are available regarding ocular manifestations among post covid patients. Hence, the present study was undertaken.

Aim

To determine the ocular manifestations in patients recovered from COVID-19 within 3 months.

Objectives

1. To find out common ocular manifestations following COVID infections.
2. To compare the ocular manifestations in home quarantine and hospitalized COVID-19 recovered patients.

Materials and Methods

The present cross-sectional study was undertaken in a tertiary care teaching hospital, Sri Venkateshwaraa Medical College Hospital and Research Centre at Puducherry by involving 70 adult patients from September 2021 to November 2021.

After obtaining institutional ethics committee clearance, study subjects were enrolled from the Outpatient department of Ophthalmology by Convenient sampling technique after applying inclusion and exclusion criteria.

Inclusion criteria

All the patients recovered from covid -19(diagnosis based on rtpcr or hrct –chest findings.)

Exclusion criteria

1.Patients with active infection of covid.

2. Age group less than 18 years.

3.Known case of pulmonary tuberculosis, pre-existing respiratory illness.

The interview method was used to collect data on socio-demographic details such as patient's name, age, gender, occupation and medical history such as history of Diabetes Mellitus, history of Covid illness, treatment taken by covid patient and covid vaccination status by using a pre-tested, semi-structured questionnaire after informed written consent from the subjects. Examination such as Visual acuity, Colour vision, AS, IOP, Fundal examination and schirmer's test were carried out on study subjects.

Data was entered in Microsoft- Excel and analysed using SPSS version 20.0. Categorical variables such as frequency and proportions were used. Chi square test was used to find the significant association between categorical variables. p-value less than 0.05 was considered to be statistically significant.

Results

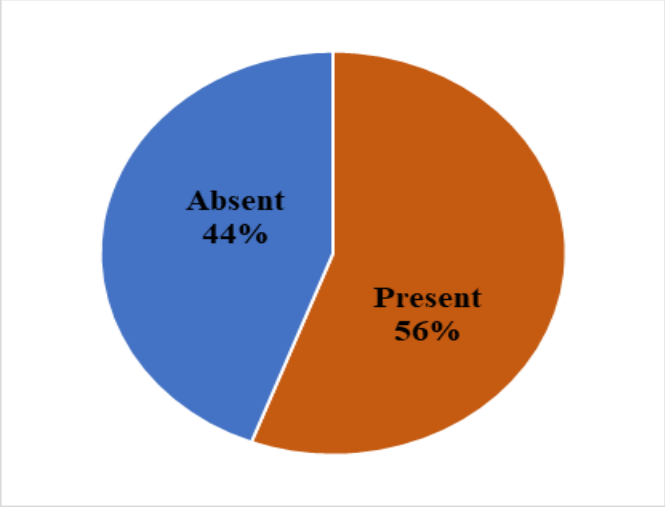
Out of 70 study subjects, 68.5% were in the age group of 31-60 years, majority 60% were male. (Table 1)

Table 1: Frequency distribution of study participant's baseline characteristics

Baseline Characteristics	Frequency (%)
Age (in years)	
≤30	15 (21.5)
31-60	48 (68.5)
>60	07 (10)
Gender	
Male	42 (60)
Female	28 (40)
Quarantine Status	
Hospital	46 (65.7)
Home	24 (34.3)
COVID-19 Severity	
Mild	63 (90)
Moderate	06 (8.5)
Severe	01 (1.5)
Co- morbidity	
Nil	50 (71.4)
One	14 (20)
More than one	06 (8.6)
COVID-19 Vaccination	
Yes	37 (53)
No	33 (47)

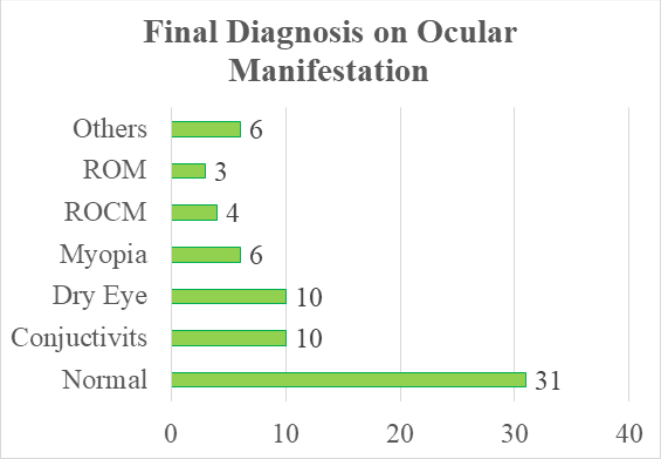
Most of the subjects i.e, 63 had mild covid -19 severity and 6 subjects had more than one comorbidity and 47 were unvaccinated. (Table 1)

Figure 1: Prevalence of ocular manifestation



The Prevalence of ocular manifestation among study subjects were 56%. (Figure 1)

Figure 2: Frequency distribution of study participant's final diagnosis of ocular manifestation.



Most of the study subjects had conjunctivitis and dry eye. (Figure 2)

Table 2: Association between ocular manifestation with Co-morbidity, Type of quarantine and Severity of disease

Variables	Ocular Manifestation (Present)	Ocular Manifestation (Absent)	Chi-square	p-value
Co-Morbidity Present Absent	 14 (70) 25 (50)	 06 (30) 25 (50)	2.31	0.18
Type of Quarantine Hospital Home	 24 (52.2) 15 (62.5)	 22 (47.8) 09 (37.5)	0.68	0.45
Severity of COVID-19 Mild Moderate Severe	 33 (52.4) 05 (100) 01 (50)	 30 (47.6) 00 (00) 01 (50)	4.28	0.11

The comorbidities, type of quarantine and severity of the disease has no significant association with ocular manifestations. (Table 2)

Discussion

- Ocular involvement in SARS CoV-2 recovered patients was 0 - 58%.
- In our study, 14% of patients developed conjunctivitis, highly comparable with study conducted by Ping Wu et al. [7]
- In contrast, a similar case control study by Guan et al in China found less than one percent of conjunctivitis.[8]
- Ping Wu et al suggested that ophthalmic manifestations are more common in patients with severe systemic disease and we found there was no significant association between ocular manifestations and systemic disease.[7]
- The comorbidities, type of quarantine and severity of the disease has no association with ocular manifestations.
- 14% of our study participants had dry eye similar to a study done by Gambini et al [9]
- Our results suggest that long-term complications are likely from the recovery of COVID-19 patients, owing to Angiotensin-converting enzyme, transmembrane serine protease 2 receptors which facilitate viral entry along the respiratory tract, conjunctiva and corneal epithelium.

Conclusions

- Dry eye and conjunctivitis are the common post COVID ocular manifestations.

- There was no significant association found between ocular manifestation with co-morbidity, type of quarantine and severity of disease.
- This study helps in determining the common ocular manifestations among COVID recovered patients and this helps in educating covid 19 patients regarding eye involvement in post covid phase and the necessity to follow up with Ophthalmologist.
- This study also thrives to create awareness among COVID recovered patients about vision and life-threatening complications like vessel occlusion and Mucormycosis.

Ethics approval and consent to participate

Institutional ethical clearance was obtained and informed consent was taken from study subjects. Institutional Ethics Committee No:98/SVMCH/IEC

My manuscript does not involve the use of any animal or human data or tissue.

List of abbreviations

SARS-CoV-2 – severe acute respiratory syndrome coronavirus 2

WHO - World Health Organization

PCS - Post Covid Syndrome

OCT - Optical Coherence Tomography

AS - Anterior Segment

IOP - Intra Ocular Pressure

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