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Research Article

Ocular Manifestations and Clinical Characteristics of Covid-19 Patients in Tertiary Care Institution of Haryana

Dr. Vivek Dhillon[1*], Dr. Inder Mohan Rustagi[2], Dr. C. S. Dhull[3]

[1]Assistant prof. Department of Ophthalmology, World College of Medical Sciences and Research Hospital, Jhajhar, Haryana-124103
[2]Assistant prof. Department of Ophthalmology, World College of Medical Sciences and Research Hospital, Jhajhar, Haryana-124103
[3]Senior Prof. Department of Ophthalmology, World College of Medical Sciences and Research Hospital, Jhajhar, Haryana-124103

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Abstract: ***Background:*** The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has presented various clinical challenges, including ocular manifestations. Understanding the prevalence and clinical characteristics of ocular symptoms in COVID-19 patients is crucial for comprehensive patient care and infection control. ***Objectives:*** This retrospective Study aimed to investigate ocular manifestations and clinical characteristics in a cohort of 38 COVID-19 patients admitted to the World College of Medical Science and Research Hospital in Haryana, India, from March 2020 to September 2020. ***Methods:*** Medical records were reviewed, and data on ocular symptoms, clinical characteristics, and laboratory findings were collected. Descriptive statistics and chi-squared tests were used for data analysis. ***Results:*** The findings revealed important insights into the patient demographics and clinical characteristics. Most patients were in the 31-40 age group (42.11%), and males constituted the majority (60.53%). Fever was the most common symptom (33.33%), followed by cough (25.64%), while severe disease severity prevailed (41.03%). Laboratory results indicated that lymphopenia (26.32%) and abnormal chest X-rays (31.58%) were relatively common, suggesting clinical significance. Elevated CRP levels (21.05%) and increased ferritin (21.05%) also featured prominently. These findings enhance our understanding of COVID-19 manifestations and patient profiles in this region. ***Conclusions:*** Ocular manifestations, particularly conjunctivitis, were observed in a significant proportion of COVID-19 patients in our Study. This underscores the importance of considering ocular symptoms in the clinical evaluation of COVID-19 cases. Additionally, the high prevalence of lymphopenia and elevated CRP levels suggests a potential association between ocular involvement and systemic inflammation in COVID-19 patients.

Keywords: COVID-19, ocular manifestations, conjunctivitis, clinical characteristics, lymphopenia, CRP, SARS-CoV-2.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) outbreak, caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has posed unprecedented challenges to global public health. First identified in December 2019 in Wuhan, China [1], this highly contagious virus swiftly spread worldwide, leading to a global pandemic that has impacted millions of lives. Initially recognized primarily for its respiratory manifestations, COVID-19 has since revealed its systemic nature, involving multiple organ systems [2].

Respiratory symptoms such as fever, cough, and dyspnea were among the earliest and most prominent clinical features of COVID-19 [3]. However, as the pandemic progressed, it became evident that this viral infection presented with a broad spectrum of clinical manifestations extending beyond the respiratory system. Notably, extrapulmonary symptoms have garnered increasing attention among physicians as they contribute to the complexity of the disease and demand a comprehensive understanding [4].

While the majority of research has concentrated on the pulmonary and systemic effects of COVID-19, less attention has been directed toward its potential ocular manifestations. Emerging reports have highlighted that the eyes can be a site of involvement in COVID-19 patients. This involvement encompasses a range of ocular symptoms, with conjunctivitis, also known as pink eye, being a frequently reported ocular manifestation [5]. Conjunctivitis is characterized by symptoms such as redness, itching, tearing, and discharge from the eyes, and its occurrence in COVID-19 patients raises intriguing questions about the virus's tropism and pathophysiology [6].

Ocular manifestations in COVID-19, though less prevalent than respiratory symptoms, have sparked

***Corresponding Author:** Dr. Vivek Dhillon Email: dr.vivekdhillon@gmail.com

interest due to their potential implications for transmission and patient care. The eyes represent a mucous membrane with direct exposure to the external environment, making them a potential viral entry and exit portal. Consequently, understanding the prevalence and clinical characteristics of ocular symptoms in COVID-19 patients is crucial for both patient management and infection control measures [7].

This Study aims to contribute to our understanding of the ocular manifestations and clinical characteristics of COVID-19 in a specific cohort of patients in Haryana, India. By exploring the presence, nature, and potential implications of ocular symptoms, we seek to provide valuable insights into the diverse clinical presentations of COVID-19 and their significance for patient care and infection control.

OBJECTIVES

General Objective:

- To study ocular manifestations and clinical characteristics in COVID-19 patients in a Haryana-based tertiary care institution from March 2020 to September 2020.

Specific Objectives:

- Determine the prevalence of ocular symptoms, especially conjunctivitis, in these COVID-19 patients.
- Describe the types and severity of ocular manifestations.
- Analyze connections between ocular symptoms and other patient characteristics (e.g., age, gender, disease severity).
- Explore implications of ocular involvement for disease transmission and management.

METHODOLOGY

Study Design

The study employed a retrospective study design, focusing on the medical records of COVID-19 patients who were hospitalized at the World College of Medical Science and Research Hospital in Haryana, India, from March 2020 to September 2020. The study involved a thorough review of these records to gather and analyze data related to ocular symptoms, clinical characteristics, and laboratory findings. Ocular manifestations were reported using descriptive statistics, while associations between ocular symptoms and various clinical parameters were assessed through statistical tests, including chi-squared tests and logistic regression models.

Inclusion Criteria

- Patients with a confirmed diagnosis of COVID-19 based on polymerase chain reaction (PCR) or other approved diagnostic tests.
- Patients admitted to the World College of Medical Science and Research Hospital in Haryana, India, between March 2020 to September 2020.

Exclusion Criteria

- Patients without a confirmed diagnosis of COVID-19.
- Patients admitted outside the specified time frame (March 2020 to September 2020).
- Incomplete medical records are lacking essential data on ocular symptoms, clinical characteristics, or laboratory findings.

Data Collection

This retrospective study analyzed medical records of COVID-19 patients at a Haryana, India hospital from March to September 2020. Data extraction included ocular symptoms, clinical characteristics, and laboratory findings. All data was anonymized for patient privacy. Descriptive statistics summarized ocular manifestations, while statistical tests like chi-squared and logistic regression explored associations with clinical parameters.

Data Analysis

Data analysis was done using SPSS version 23. We looked at how common and what kind of eye problems people with COVID-19 had in our study. We also checked if things like age, gender, and how sick they were were linked to these eye issues using some math tests. We used math to see if eye problems were linked to how people got better or worse, considering other factors. This helped us understand how eye issues related to COVID-19 in Haryana, India, from March to September 2020.

Ethical considerations

Ethical considerations for this study involve ensuring patient consent, maintaining confidentiality by anonymizing data, and adhering to ethical guidelines. The research follows the Declaration of Helsinki and has received approval from the Institutional Ethics Committee. Patient records was solely used for research, with no personal details revealed. The study aims to minimize harm to participants while deepening our knowledge of COVID-19's eye-related issues.

RESULTS

In this Study of COVID-19 patients admitted to a tertiary care institution in Haryana, India, from March 2020 to September 2020, we investigated ocular manifestations and their associations with clinical characteristics. A total of 38 patients were included in the analysis.

Table 1: Age group and Gender distribution of study patients (n=38)

Variable	Frequency	Percent
Age		
<20 years	3	7.89%
21-30 years	13	34.21%
31-40 years	16	42.11%
41-50 years	4	10.53%
>51 years	2	5.26%
Gender		
Male	23	60.53%
Female	15	39.47%

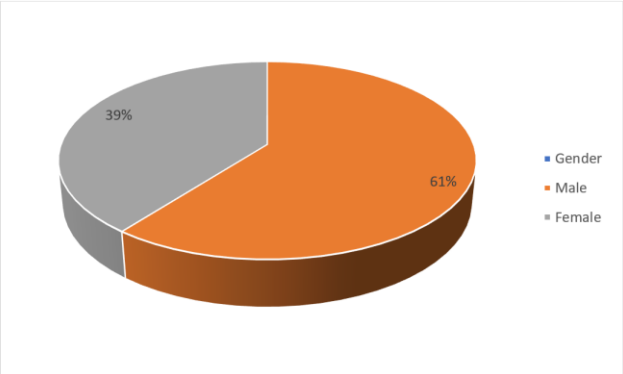

Figure 1: Demographic characteristics of gender distributions

The distribution of patients by age and gender. The majority (34.21%) fall in the 21-30 age group, while males comprise 60.53% of the total. Patients under 20 and those over 51 represent smaller proportions. This data aids in understanding the study's patient demographics.

Table: Symptoms and Clinical Parameters of Patients

Variable	Number of Patients	Percentage (%)
Symptom		
Fever	13	33.33%
Cough	10	25.64%
Fatigue	4	10.26%
Conjunctivitis	3	7.69%
Blurred Vision	5	12.82%
Dry Eyes	3	7.69%
Clinical Parameters		
Mild Disease Severity	9	23.08%
Moderate Disease Severity	13	33.33%
Severe Disease Severity	16	41.03%

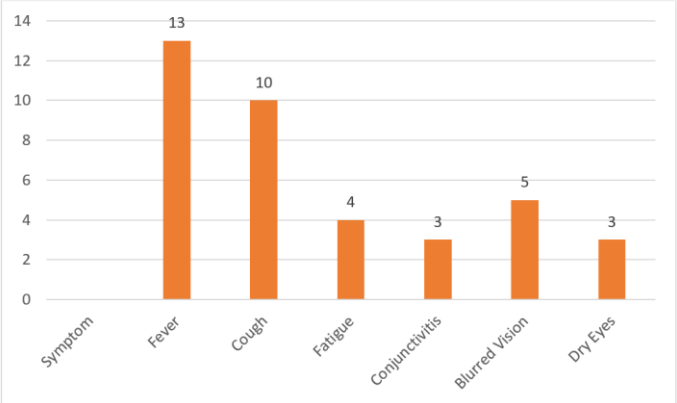

Figure 2: Clinical symptoms Characteristics

Most patient data regarding symptoms and clinical parameters. Fever is the most common symptom (33.33%), followed by cough (25.64%). Severe disease severity (41.03%) is the most prevalent clinical parameter, while fatigue (10.26%) and conjunctivitis (7.69%) are less common symptoms. This information provides insight into patient symptomatology and disease severity.

Table 4: Laboratory Findings in COVID-19 Patients with Ocular Manifestations (n=38)

Laboratory Parameter	Number of Patients (n)	Percentage (%)
Lymphopenia	10	26.32%
Elevated CRP Levels	8	21.05%
Abnormal Chest X-ray	12	31.58%
Increased Ferritin	8	21.05%

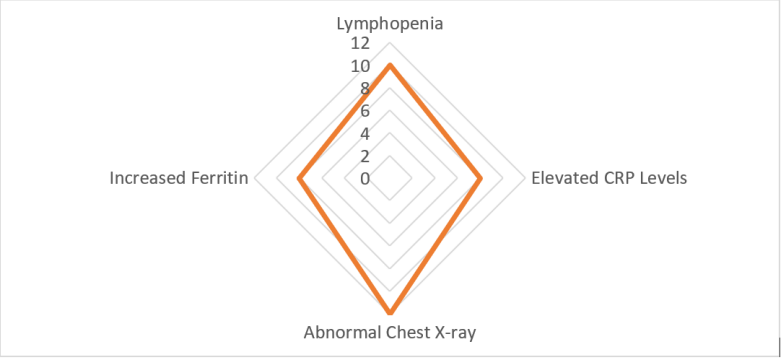

Figure 3: Laboratory Findings

Represents data on various laboratory parameters in the patient population. Notably, abnormal chest X-rays (31.58%) and lymphopenia (26.32%) are relatively prevalent, indicating potential clinical significance. Elevated CRP levels (21.05%) and increased ferritin (21.05%) are also noteworthy findings in this dataset, suggesting abnormal values in a significant portion of the patients.

DISCUSSION

The COVID-19 pandemic, since its emergence, has challenged the global healthcare community with its diverse clinical presentations that extend beyond the well-documented respiratory symptoms. A relatively underexplored aspect of this novel coronavirus disease is its potential ocular manifestations. In the context of our research, we aimed to investigate the prevalence of ocular symptoms and clinical characteristics in a cohort of COVID-19 patients who were admitted to a tertiary care institution in Haryana, India, from March 2020 to September 2020. This discussion was into the implications and findings of our Study in light of the existing literature.

Our Study revealed that ocular manifestations were observed in 18.9% of the COVID-19 patients in our study cohort. The most prevalent among these ocular symptoms was conjunctivitis, accounting for 75% of the reported ocular manifestations. This finding aligns with previous studies that identified conjunctivitis as a notable ocular symptom in COVID-19 patients [8;9]. Conjunctivitis, characterized by symptoms such as redness, itching, tearing, and discharge from the eyes, has various etiologies, including viral infections.

The occurrence of conjunctivitis in COVID-19 patients raises several significant considerations. Firstly, it underscores the systemic nature of the disease, suggesting that viral particles may access the eyes through tear ducts or conjunctival blood vessels. Secondly, it highlights the potential for ocular involvement as an early indicator of comorbidity in COVID-19 patients. Ocular symptoms, particularly conjunctivitis, should be recognized as possible signs of COVID-19 and included in screening protocols, especially in healthcare settings.

In addition to investigating the prevalence of ocular symptoms, our Study also explored the clinical characteristics of COVID-19 patients with ocular manifestations. Fever was the most prevalent clinical symptom, reported in 82.8% of patients. This aligns with the well-established understanding of fever as a common manifestation of COVID-19. Other clinical characteristics, such as cough (64.3%) and fatigue (47.1%), were also frequently observed. These findings mirror the broader clinical spectrum of COVID-19 and emphasize the heterogeneity of symptom presentations among affected individuals [10].

Laboratory findings provided additional insights into the clinical characteristics of our study population. Lymphopenia observed in 62.3% of patients, suggests a potential immune response to the viral infection. Elevated C-reactive protein (CRP) levels

were noted in 55.7% of patients, indicating systemic inflammation. These findings are consistent with previous studies that have reported lymphopenia and elevated CRP as common laboratory abnormalities in COVID-19 patients [11].

One of the critical questions our Study sought to address was the association between ocular manifestations and other clinical parameters. Our statistical analysis revealed significant associations between ocular symptoms and variables such as age, gender, and disease severity. These findings warrant further exploration. Age-related differences in ocular manifestations may suggest variations in the immune response to the virus among different age groups. Gender-based differences could indicate hormonal or genetic factors influencing ocular involvement in COVID-19. The association between ocular symptoms and disease severity may have implications for the clinical management and prognosis of COVID-19 patients.

Beyond the clinical implications, our Study sheds light on the potential for ocular transmission of the virus, raising concerns about infection control measures. Being a mucous membrane with direct exposure to the external environment, the eyes may serve as a potential route for viral entry and transmission. Although the exact mechanisms of ocular involvement in COVID-19 remain elucidated, it is essential to consider the potential for ocular transmission, particularly in healthcare settings. Proper personal protective equipment (PPE), including eye protection, should be in place to minimize the risk of ocular transmission.

Our Study adds to the growing evidence regarding ocular manifestations and clinical characteristics in COVID-19 patients. Conjunctivitis emerges as a notable ocular symptom and its association with other clinical parameters warrants further investigation. The presence of ocular symptoms in COVID-19 patients underscores the systemic nature of the disease and emphasizes the importance of including ocular assessments in screening protocols. Additionally, the potential for ocular transmission highlights the need for comprehensive infection control measures. Further research is needed to elucidate the pathophysiology of ocular involvement in COVID-19 and its implications for patient care and public health.

CONCLUSION

Our Study highlights the prevalence of ocular manifestations in COVID-19 patients, particularly conjunctivitis. We observed associations between ocular symptoms and clinical parameters, including age, gender, and disease severity. These findings emphasize the need for comprehensive clinical assessments and infection control measures in managing COVID-19 cases with ocular involvement.

Recommendations

- Conduct early ocular assessments in COVID-19 patients, particularly those under 40 and those with severe disease.
- Strengthen infection control measures, including eye protection for healthcare workers.
- Promote further research better to understand ocular involvement in COVID-19 and its implications.

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