

A Study of Ocular Manifestations in Health Care Workers Working in Covid 19 Facility of a Tertiary Care Hospital

Dr Nandita Rane¹, Dr Veerendra Godbole^{2*}

¹Junior resident, Dept of Ophthalmology, Smt Kashibai Navale medical college and general hospital

²Professor, Dept of Ophthalmology, Smt Kashibai Navale medical college and general hospital

***Corresponding Author: Dr.Veerendra Godbole**, Professor, Dept of Ophthalmology, Smt Kashibai Navale medical college and general hospital. **E-mail:** nandita510.nr@gmail.com

Abstract

Aim: To study the ocular symptoms in health care workers working in the covid 19 facility for early diagnosis and prevention of possible spread of the infections and to study the ocular symptoms due to exposure to sodium hypochlorite

Materials and Methods: The study was a cross sectional observational type of study conducted among the health care workers working in the COVID 19 facility of a tertiary care hospital in the city of Pune. The study tool was a structured e- questionnaire and the data was analysed statistically

Results: 51.1% of the participants experienced symptoms like redness, burning, watering, foreign body sensation, blurring of vision and dryness due to exposure to the disinfecting agent hypochlorite. 30.7% did not experience any symptoms .The ocular complaints subsided within a few hours without any treatment in 45.8%

Keywords: COVID 19, eye symptoms, hypochlorite exposure

1. INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the novel coronavirus first detected in Wuhan China, that causes coronavirus disease 2019 (Covid -19). The infection spread across the globe at a rapid pace⁽¹⁾ and has now become a global pandemic giving rise to a large spectrum of manifestations, leading to significant morbidity and mortality since then⁽²⁾. In many countries the exponential growth of Covid-19 cases is overwhelming health care systems with overcrowding of hospitals and overflowing Intensive Care Units. . While people must stay at home to reduce the spread of this virus health-care workers are required to do the exact opposite. About 1-3% of people with COVID 19 develop ophthalmological symptoms⁽³⁾. The ocular symptoms may be due to a viral cause or due to exposure to chemicals used for disinfecting the covid facility. for this reason it is necessary to investigate health care workers in contact with covid patients directly or indirectly during this global pandemic

2. MATERIALS AND METHODS

2.1. Ethical Approval

This study was conducted under the principles and guidelines and in accordance with the tenets as outlined in the Declaration of Helsinki (2008)

2.2. Study

This cross sectional study was conducted over a period of 3 months from May to August at a tertiary care hospital consisting of a special covid 19 facility. a total of 88 health care workers including resident doctors , nurses, paramedical staff and interns were studied after obtaining a due written informed consent .Basic demographic data including age , gender and participants residence was recorded . The participants were asked to respond to a close ended questionnaire circulated to them. The participants were asked to select appropriate answers from the given options for each question in the structured questionnaire. The questionnaire was designed to assess the ocular symptoms In health care workers and to associate them with covid 19 and exposure to sodium hypochlorite which is used to disinfect the surroundings in the facility

3. RESULTS

Out of the total 88 participants in the study, 44(50.6%) were females and 43(49.4%) were males. Participants were in the age group of 23-48 years, all having worked in the covid facility in the capacity of either an intern, resident doctors, senior faculty, nurse, or paramedical staff as shown in figure 1. All participants had shifts ranging from 8-10 hrs for 7 days

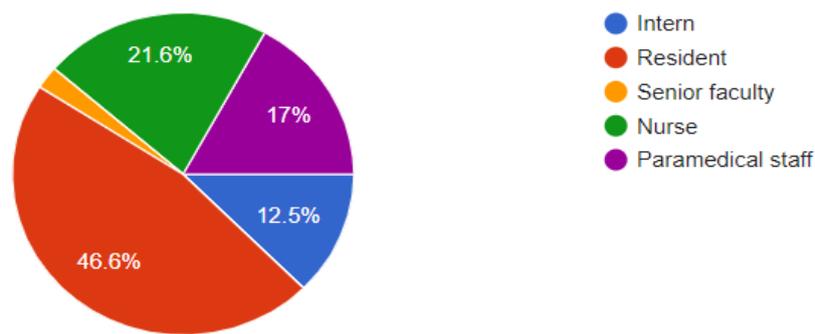


Figure1. Participants included in the study

Out of the participants, 70.5% were posted in the ward, 23.9% in the covid ICU with the rest

working in the fever OPD and the laboratory as shown in figure 2.

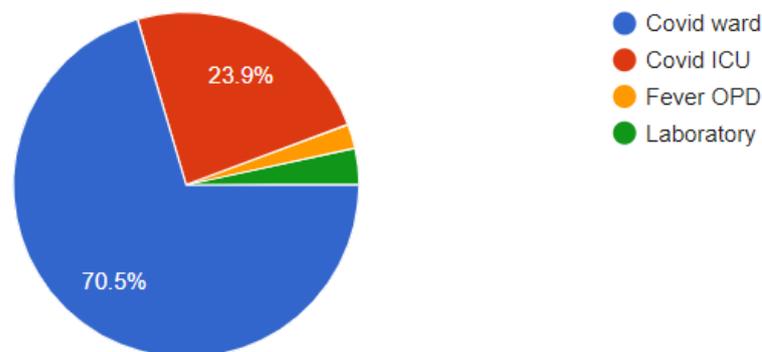


Figure2. Type of work

1.1% of the participants had hypertension, 3.4% were known cases of thyroid disorders whereas the rest of the participants did not suffer from any known co-morbidities .During their shifts in the covid facility 95.9% wore personal

protective equipments throughout their shift .The use of protective eye gear was however variable with only 54.5% wearing it all throughout their shifts as shown in figure 3

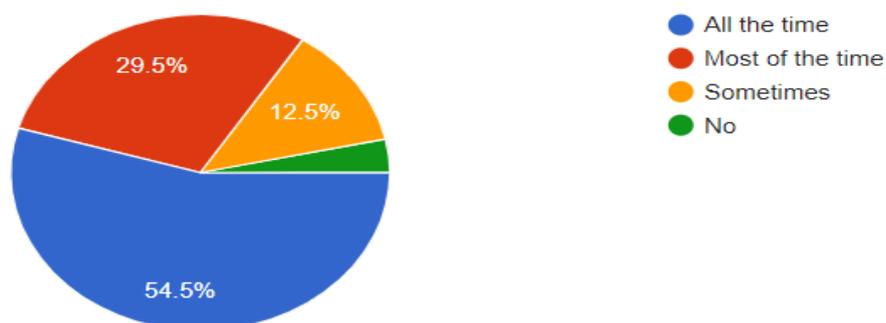


Figure3. Use of protective eye gear

Majority(86.4%) of the participants noticed cleaning of their surroundings atleast once throughout their shift with hypochlorite as shown in figure 4.51.1% of the participants experienced symptoms like redness, burning, watering, foreign body sensation, blurring of vision and dryness due to the fumes of the disinfecting agent whereas 30.7% did not

experience any symptoms. The ocular complaints subsided within a few hours without any treatment in 45.8%. 2 of the participants having had direct contact with hypochlorite solution experienced redness, burning and watering and had to consult an ophthalmologist for further treatment.

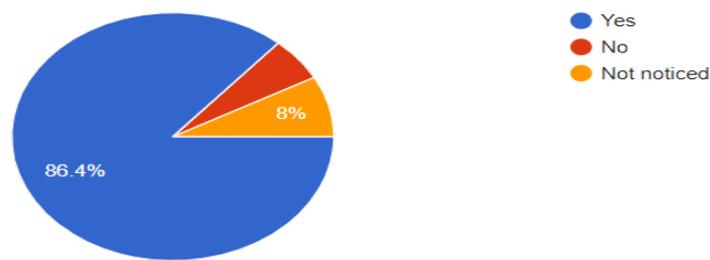


Figure4. participants awareness about cleaning with hypochlorite during their shift

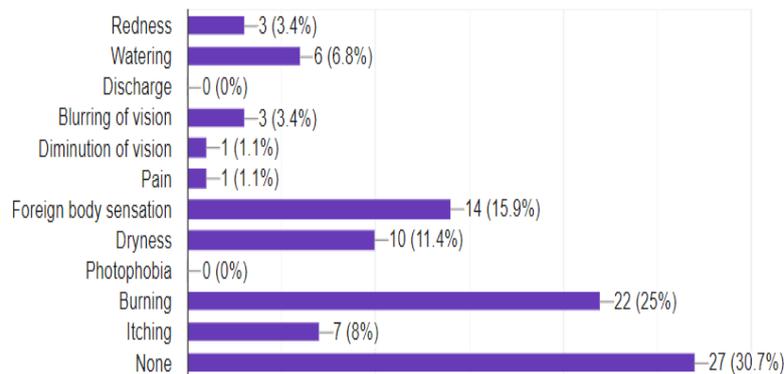


Figure5. Symptoms experienced due to exposure to hypochlorite

only 6% of the participants were tested positive for covid 19. Out of this 6% only one participant had ocular symptoms of redness, watering and discharge for which they consulted an ophthalmologist. The rest of the participants had no ocular complaints

4. DISCUSSION

The emerging disease COVID-19 caused by the new coronavirus SARS-CoV-2 was first identified in Wuhan, China in December 2019⁽⁴⁾. the virus has sparked a pandemic and is spreading rapidly in many countries⁽⁵⁾

Coronavirus (CoV) infections are emerging respiratory viruses and are known to cause illness ranging from the common cold to severe acute respiratory syndrome (SARS)⁽⁶⁾

COVID-19 is spread by human-to-human transmission through droplet, feco-oral, and direct contact and has an incubation period of 2-14 days⁽⁷⁾

To date, no antiviral treatment or vaccine has been explicitly recommended for COVID-19. Therefore, applying preventive measures to control COVID-19 infection is the most critical intervention⁽⁸⁾. With the currently mounting COVID-19 transmission raising tensions for everyone, including health officials and health systems, an important question arises regarding how we manage information to help frontline HCWs in times of public health crisis.

Conjunctival involvement in the form of congestion with watering has been noted even with the previous corona virus pandemic in 2003-04,^[9] but was not explored further. With the onset of COVID-19 pandemic, reports of association of conjunctival congestion in a few patients who tested positive for COVID-19 started emerging⁽¹⁰⁾. Some hypotheses for route of spread have been proposed, ranging from a direct ocular mucous membrane inoculation of virus, to spread through lacrimal duct through nasopharynx and systemic spread to ocular surface through lacrimal gland, although none of these are proven⁽¹¹⁾. Patients with COVID-19 may show prodromal symptom of conjunctivitis in cases where eye goggles were not worn while in close proximity with other COVID-19 positive patients, leading to suggestions that ocular exposure might be a potential route of SARS-CoV-2 infection⁽¹²⁾.

In our study, only 6% of the participants were tested positive for the virus as the criteria for testing in the institute was the appearance of cough, fever. this resulted in a limitation to the study as a larger sample size would be required to prove a correlation between the appearance of symptoms and a positively tested subject .The facility for RTPCR testing of conjunctival swab of the participants presenting with symptoms was not available in the institute and this also proved to be a limitation to the study

There are a wide range of disinfectants available that can be used to disinfect surfaces⁽¹³⁾. Kampf et al.⁽¹⁴⁾ have noted that other coronaviruses, e.g. SARS and MERS, can persist on inanimate surfaces like metal, glass, or plastic for up to 9 days, but can be efficiently inactivated by surface disinfection procedures with 62–71% ethanol, 0.5% hydrogen peroxide, or 1% sodium hypochlorite within 1 min.

Corneal injuries from ocular exposure to hypochlorite are generally mild with burning discomfort and superficial disturbance of the corneal epithelium with recovery within 1 or 2 days. With higher concentration solutions, severe eye irritation can occur.⁽¹⁵⁾ Direct contact with hypochlorite solutions, powder, or concentrated vapour causes severe chemical burns, leading to cell death and ulceration. Contact with low concentrations of household bleach causes mild and transitory irritation if the eyes are rinsed, but effects are more severe and recovery is delayed if the eyes are not rinsed. Exposure to solid hypochlorite or concentrated solutions can produce severe eye injuries with chemosis of the conjunctiva, necrosis and clouding of the cornea, iritis, cataract formation, or severe retinitis.⁽¹⁶⁾

In the present study 86.4% of the participants noticed cleaning of their surroundings with hypochlorite during their shift and 51.1% experienced symptoms which self resolved in 45.8 % within a few hours. 20% of the participants had direct contact with hypochlorite solution after which they experienced redness, burning and watering for which they consulted an ophthalmologist and were given appropriate treatment. Even though 95.9% of the participants wore personal protective equipment, only 54.5% wore protective eye gear throughout their shift and this could be a reason for increased symptoms due to exposure to hypochlorite solution.

5. CONCLUSION

The present study reveals that majority of the health care workers experienced ocular symptoms while working in the covid19 facility of a tertiary care hospital most likely to be due to exposure to hypochlorite solution either directly or indirectly.

Ocular symptoms are a known finding in covid 19 positive patients and therefore should be

considered as a testing criteria in tertiary care hospitals to promote early diagnosis and treatment of the infection and awareness needs to be created about the same

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