

Preoperative universal screening of coronavirus disease 2019 during Omicron outbreak in patients undergoing ophthalmic surgeries: Experience from a tertiary eye care center in Saudi Arabia

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Abstract:

PURPOSE: This study aims to determine the frequency of coronavirus disease 2019 (COVID-19) during Omicron outbreak among patients scheduled for elective and emergency ophthalmic surgeries in a tertiary eye care center in Saudi Arabia.

METHODS: This observational retrospective study was performed between December 1, 2021, and February 28, 2022, in a single tertiary eye care center in Riyadh, Saudi Arabia. All patients who were given appointments for elective or emergency surgeries were included. All patients underwent preoperative nasopharyngeal and oropharyngeal reverse transcription–polymerase chain reaction testing for the severe acute respiratory syndrome coronavirus 2. A retrospective chart review of all patients who tested positive for COVID-19 during Omicron outbreak was performed for the demographic and clinical information, presence of symptoms upon presentation, nature and urgency of the scheduled surgical intervention, and the overall outcomes.

RESULTS: A total of 851 patients were scheduled for elective and emergency ophthalmic surgeries during the study period. The mean age of all patients was 58.2 years; 451 were males (52.9%) and 400 were females (47%). Of 851 patients tested for the COVID-19 during Omicron outbreak, the test was positive in 65 (7.6%) patients. All patients who tested positive for the COVID-19 during Omicron outbreak were asymptomatic at the time of swabbing. No patient-related perioperative complications or health-care workers' affection secondary to exposure to positive cases was documented.

CONCLUSION: The study showed that almost 1 in 13 patients scheduled for elective or emergency ophthalmic surgeries may test positive for the COVID-19 during Omicron outbreak. All positive cases were asymptomatic at the time of swabbing, highlighting the importance of routine preoperative screening for COVID-19.

Keywords:

Asymptomatic, coronavirus, coronavirus disease 2019, Omicron, screening, severe acute respiratory syndrome coronavirus 2, variant

INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a strain of coronaviruses that is responsible for coronavirus disease 2019 (COVID-19), has spread around the world after being reported for the first time in Wuhan, China, in late December 2019 leading the World Health Organization (WHO) to

announce COVID-19 as a global pandemic.^[1,2] Until March 2022, the number of confirmed COVID-19 cases is estimated to be more than 441 million and nearly 6 million attributed deaths affecting more than 203 countries globally.^[3] In Saudi Arabia, the first confirmed case of COVID-19 was reported on March 2, 2020, after which there has been a rapid increase in COVID-19 cases.^[4] The Saudi

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government implemented several measures to slow down the spread of the disease in early March including the closure of schools, universities, and commercial centers, promoting social distancing measures and applying restrictions on dining in restaurants. In late March 2020, the Saudi government imposed a curfew including transportation restrictions, suspension of workplace attendance, and cessation of all domestic and international flights aiming to prevent the further spread of the virus. On June 21, the lockdown was lifted in sequential phases as the number of new COVID-19 cases has decreased while the recovery rate has increased. At the time of writing this manuscript on March 4, 2022, the total number of positive COVID-19 cases in Saudi Arabia was 735,356 cases resulting in 9005 deaths.

COVID-19 global pandemic has resulted in the cancellation of a substantial number of elective surgeries across the world. Several agencies and expert groups have recommended postponing elective procedures since patients with COVID-19 have a higher risk of developing perioperative complications with an increased rate of mortality compared to patients without COVID-19.^[5,6] As a result of this, our tertiary eye care center decided to decrease its surgical volume and to perform only acute ophthalmic surgeries in March 2020. As the country started gradually to re-open in June 2020, our center started to vigilantly resume elective surgeries in a stepwise manner with additional precautionary measures. One of the major measures implemented in response to the pandemic was the mandatory preoperative screening for COVID-19 using reverse transcription–polymerase chain reaction (RT-PCR) prior to any elective or emergency procedure considering the increased perioperative mortality rate associated with COVID-19 and the risk of transmission of the virus between health-care workers and patients. On November 26, 2021, the WHO designated variant B.1.1.529 a variant of concern, following advice from the WHO's Technical Advisory Group on Virus Evolution. The variant was given the name Omicron. Omicron is a highly divergent variant with high number of mutations, including 26–32 mutations in the spike protein, some of which are associated with humoral immune escape potential and higher transmissibility. The Omicron variant comprises four lineages including B.1.1.529, BA.1, BA.2, and BA.3.^[7] In December 1, 2021, the Ministry of Health (MOH) in Saudi Arabia confirmed the first case of COVID-19 Omicron variant which was detected in the kingdom in a citizen coming from a North African country.^[8] The Omicron variant spreads more easily than the original virus that causes COVID-19 and the Delta variant. The Centers for Disease Control and Prevention expects that anyone with Omicron infection can spread the virus to others, even if they are vaccinated or do not have any symptoms.^[9]

The purpose of this study was to determine the frequency of Omicron among patients scheduled for elective and emergency ophthalmic surgeries in a tertiary eye care center in Saudi Arabia.

METHODS

This observational retrospective study was conducted at the Department of Ophthalmology, King Abdulaziz University Hospital, King Saud University in Riyadh, Saudi Arabia, between December 1, 2021, and February 28, 2022. We included all patients who were given appointments for elective surgeries or admitted for emergency surgeries during the study period. All patients underwent a routine preoperative assessment including vital signs, electrocardiogram, and chest X-rays. All patients underwent preoperative nasopharyngeal and oropharyngeal RT-PCR testing for SARS-CoV-2 virus at the time of admission for emergency cases and 48 h prior to admission for elective cases. At the time of swabbing, all patients and attendants were requested to fill out a COVID-19 questionnaire, which included questions about the presence of COVID-19 symptoms (such as fever, cough, rhinorrhea, anosmia, dysgeusia, diarrhea, shortness of breath, and chest pain), history of contact with a confirmed or suspected COVID-19 patient, and any recent history of travel. For asymptomatic patients with a negative screening result, the surgery was performed as scheduled. For patients with a positive test result, each surgeon was contacted by the Infection Control Department to assess the urgency of the procedure and the potential harm from postponing the surgery. In general, patients with positive test results who were scheduled for elective surgeries were postponed until they get cleared from the virus except if this delay will cause harm to the patient. For patients who required urgent surgical interventions with a positive COVID-19 test result, the surgery was performed with additional perioperative precautionary measures such as using of N95 mask, performing the surgery in a negative pressure room, and minimizing the number of health-care staff entering the room. If the COVID-19 test result was pending and the patient needed urgent surgery, the patient was labeled as COVID-19 suspect and the surgery was performed with all precautionary measures used in positive cases.

A retrospective chart review of all patients who tested positive for COVID-19 was performed for the associated demographic and clinical information, presence of symptoms upon presentation, nature and urgency of the scheduled surgical intervention, and the overall outcomes. The study adhered to the standards set forth by the Health Insurance Portability and Accountability Act, and the Declaration of Helsinki for research involving humans. General informed written consent was obtained from all patients including permission for anonymous use of their clinical information. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 24 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented using percentages and frequencies.

RESULTS

Between December 1, 2021, and February 28, 2022, a total of 851 patients were scheduled for elective or emergency

ophthalmic surgeries in our center. The mean standard deviation age of all patients was 58.2 (9.8) years; 451 were males (52.9%) and 400 were females (47%). Overall, 65 patients (7.6%) tested positive for COVID-19. Table 1 shows the number of scheduled surgeries, number of positive COVID-19 Omicron variant cases, and average number of COVID-19 during Omicron outbreak in Riyadh by month.

The frequency of positive COVID-19 cases during Omicron outbreak was calculated as 7.6% (65 out of 851 patients); all positive cases were asymptomatic. Table 2 summarizes the demographic and clinical data of these patients. Of the 65 patients with a positive COVID-19 test result, the surgical intervention was performed in 10 patients (7 traumatic open globes, 2 lens-induced glaucomas, and 1 corneal perforation) prior to the release of the swab results. These 10 patients were considered COVID-19 suspects, and the surgeries were performed with additional precautionary measures. No patient-related perioperative complications were documented for any of these patients. Moreover, no health-care worker was affected by the COVID-19 virus secondary to exposure to these patients. The remaining 55 patients were scheduled for elective surgeries that were postponed before testing negative and being asymptomatic. All patients who tested positive for COVID-19 were asymptomatic at the time of swabbing.

DISCUSSION

The study was performed to determine the frequency of COVID-19 during Omicron outbreak among patients scheduled for elective or emergency ophthalmic surgeries in a tertiary eye care center in Saudi Arabia. This study also looked at the demographic and clinical information of the patients who tested positive for the COVID-19 during Omicron outbreak.

Our study showed that the frequency of COVID-19 positive cases during Omicron outbreak was 7.6% and none of the positive patients reported any of the COVID-19 symptoms. In contrast to a study conducted in the same center earlier on in the pandemic, the frequency of positive patients was 2.3% versus 7.6% during the Omicron outbreak.^[10] One recent study showed that 2.2% of patients scheduled for elective vitreoretinal surgeries in a tertiary eye care center in India were COVID-19

positive and none of the positive cases was symptomatic.^[11] Another study conducted in New York city showed that 12.1% of patients scheduled for essential orthopedic surgeries were COVID-19 positive with an asymptomatic rate of 58.3%.^[12] A study with a large sample size conducted in Los Angeles showed a low prevalence (0.3%) of COVID-19 among patients undergoing preoperative screening for different types of surgeries and reported that 42% of the positive cases were asymptomatic.^[13] Table 3 summarizes the findings of the previously cited studies.

In our study, we found a correlated association between the number of positive COVID-19 cases during Omicron outbreak in our center and the monthly average number of positive cases in Riyadh city by observing the numbers reported by the Saudi MOH.^[14] One possible explanation is that COVID-19 Omicron variant is highly transmissible leading to an increase in the number of positive cases.

Several studies have documented the asymptomatic proportion of COVID-19 patients who were identified by screening in the general population. One study has shown that 9.6% of Wuhan city’s residents had positive serology tests for COVID-19 and have never manifested any of the COVID-19 symptoms.^[15] Another study showed that 30.8% of individuals who tested positive for COVID-19 were asymptomatic at the time of testing.^[16]

Asymptomatic COVID-19 poses a serious public health issue given the difficulty in identifying these patients without formal testing. A routine preoperative COVID-19 screening is a great tool to detect asymptomatic cases to prevent the spread of the disease, protect health-care providers, and decrease perioperative complications. Several medical centers across the world adapted preoperative RT-PCR as a gold standard screening test to evaluate patients for COVID-19 infection. The WHO advised against using an antibody for COVID-19 screening for several reasons: (1) these antibodies need 2 weeks to form, (2) the possibility of cross-reactivity with other coronaviruses, and (3) many patients do not develop detectable antibodies.^[17,18]

Multiple reports have documented that thousands of health-care workers have been infected with COVID-19 due to transmission from asymptomatic patients despite adherence to infection control measures.^[19,20] Moreover, several articles highlighted the great risk of COVID-19 transmission to health-care workers from asymptomatic patients.^[21-23] A recent study has shown that COVID-19 patients undergoing elective surgeries have a higher risk to develop perioperative respiratory complications and are associated with 19% perioperative mortality. Furthermore, another study showed that performing elective surgeries for patients with COVID-19 is associated with COVID-19 disease progression and increased rate of mortality.^[24] Thus, it may be advisable to postpone nonurgent cases in COVID-19 Omicron variant-positive patients.

There are several limitations to our study. The data were collected retrospectively and were dependent on the quality

Table 1: The number of scheduled surgeries, number of positive coronavirus disease 2019 during Omicron outbreak cases, and average number of coronavirus disease 2019 during Omicron outbreak cases in Riyadh city by month

| Month | Number of scheduled surgeries | Number of positive COVID-19 cases | Average number of COVID-19 cases in Riyadh city |
|----------|-------------------------------|-----------------------------------|---|
| December | 340 | 9 | 74 |
| January | 259 | 26 | 1284 |
| February | 252 | 30 | 632 |
| Total | 851 | 65 | 663 |

COVID-19: Coronavirus disease 2019

Table 2: The demographic and clinical data of patients who tested positive for the coronavirus disease 2019 during Omicron outbreak

| Patient number | Age/gender | Status | Urgency of surgery | Diagnosis | Systemic diseases |
|----------------|------------|--------------|--------------------|--|--------------------------|
| 1 | 61/female | Asymptomatic | Elective | Cataract | Diabetic |
| 2 | 50/female | Asymptomatic | Elective | Cataract | Diabetic |
| 3 | 59/male | Asymptomatic | Elective | Cataract | Dyslipidemia |
| 4 | 57/female | Asymptomatic | Elective | Cataract | Diabetic |
| 5 | 76/male | Asymptomatic | Elective | Silicone oil removal | Diabetic, hypertensive |
| 6 | 63/female | Asymptomatic | Elective | Vitreous hemorrhage | Diabetic, hypertensive |
| 7 | 72/male | Asymptomatic | Elective | Silicone oil removal | Diabetic, hypertensive |
| 8 | 36/male | Asymptomatic | Elective | Rhegmatogenous retinal detachment macula-off | Hypertensive |
| 9 | 50/male | Asymptomatic | Elective | Pterygium | Medically free |
| 10 | 22/male | Asymptomatic | Elective | Chronic dacryocystitis + nasolacrimal duct obstruction | Medically free |
| 11 | 71/male | Asymptomatic | Elective | Vitreous hemorrhage | Diabetic, hypertensive |
| 12 | 61/male | Asymptomatic | Elective | Glaucoma | Hypertensive, asthmatic |
| 13 | 55/male | Asymptomatic | Elective | Traction retinal detachment | Diabetic, hypertensive |
| 14 | 26/female | Asymptomatic | Elective | Traction retinal detachment | Diabetic, hypertensive |
| 15 | 27/female | Asymptomatic | Elective | Implantable collamer lens | Medically free |
| 16 | 22/male | Asymptomatic | Elective | Aphakia | Medically free |
| 17 | 55/male | Asymptomatic | Elective | Cataract | Hypertensive |
| 18 | 17/male | Asymptomatic | Elective | Traumatic cataract | Medically free |
| 19 | 52/male | Asymptomatic | Elective | Cataract | Medically free |
| 20 | 48/female | Asymptomatic | Elective | Cataract | Medically free |
| 21 | 57/female | Asymptomatic | Elective | Cataract | Diabetic |
| 22 | 56/female | Asymptomatic | Elective | Traction retinal detachment | Diabetic, hypertensive |
| 23 | 41/male | Asymptomatic | Emergency | Lens-induced glaucoma | Medically free |
| 24 | 30/female | Asymptomatic | Emergency | Open globe | Medically free |
| 25 | 67/female | Asymptomatic | Elective | Aphakia | Diabetic, hypertensive |
| 26 | 63/male | Asymptomatic | Elective | Vitreous hemorrhage | Diabetic, hypertensive |
| 27 | 71/male | Asymptomatic | Elective | Vitreous hemorrhage | Diabetic, dyslipidemia |
| 28 | 46/female | Asymptomatic | Emergency | Lens-induced glaucoma | Medically free |
| 29 | 27/male | Asymptomatic | Emergency | Open globe + intraocular foreign body | Medically free |
| 30 | 49/male | Asymptomatic | Emergency | Open globe | Medically free |
| 31 | 51/female | Asymptomatic | Elective | Cataract | Medically free |
| 32 | 57/female | Asymptomatic | Elective | Cataract | Diabetic |
| 33 | 56/male | Asymptomatic | Elective | Chronic dacryocystitis + nasolacrimal duct obstruction | Medically free |
| 34 | 50/male | Asymptomatic | Elective | Cataract | Hypertensive |
| 35 | 57/female | Asymptomatic | Elective | Cataract | Diabetic |
| 36 | 61/male | Asymptomatic | Elective | Cataract | Diabetic, hypertensive |
| 37 | 68/female | Asymptomatic | Elective | Cataract | Diabetic |
| 38 | 51/male | Asymptomatic | Elective | Cataract | Medically free |
| 39 | 53/female | Asymptomatic | Elective | Cataract | Hypothyroidism |
| 40 | 81/male | Asymptomatic | Elective | Cataract | Medically free |
| 41 | 76/male | Asymptomatic | Elective | Silicone oil removal | Diabetic, hypertensive |
| 42 | 58/female | Asymptomatic | Elective | Cataract | Diabetic |
| 43 | 49/male | Asymptomatic | Elective | Cataract | Medically free |
| 44 | 55/female | Asymptomatic | Elective | Cataract | Diabetic, hypothyroidism |
| 45 | 52/male | Asymptomatic | Elective | Cataract | Medically free |
| 46 | 66/female | Asymptomatic | Elective | Cataract | Diabetic |
| 47 | 62/female | Asymptomatic | Elective | Cataract | Diabetic |
| 48 | 69/male | Asymptomatic | Elective | Cataract | Medically free |
| 49 | 54/female | Asymptomatic | Elective | Cataract | Diabetic |
| 50 | 53/female | Asymptomatic | Elective | Cataract | Dyslipidemia |
| 51 | 59/male | Asymptomatic | Elective | Cataract | Medically free |
| 52 | 65/male | Asymptomatic | Elective | Cataract | Diabetic, dyslipidemia |
| 53 | 58/female | Asymptomatic | Elective | Cataract | Diabetic |
| 54 | 53/male | Asymptomatic | Elective | Cataract | Dyslipidemia |
| 55 | 60/female | Asymptomatic | Elective | Cataract | Diabetic |

Contd...

Table 2: Contd...

| Patient number | Age/gender | Status | Urgency of surgery | Diagnosis | Systemic diseases |
|----------------|------------|--------------|--------------------|---------------------------------------|--------------------------------|
| 56 | 57/female | Asymptomatic | Elective | Cataract | Diabetic |
| 57 | 54/female | Asymptomatic | Elective | Cataract | Diabetic |
| 58 | 65/female | Asymptomatic | Elective | Cataract | Medically free |
| 59 | 61/male | Asymptomatic | Emergency | Open globe + intraocular foreign body | Hypertensive |
| 60 | 32/male | Asymptomatic | Emergency | Open globe | Medically free |
| 61 | 21/male | Asymptomatic | Emergency | Open globe | Medically free |
| 62 | 49/female | Asymptomatic | Emergency | Open globe | Medically free |
| 63 | 76/male | Asymptomatic | Emergency | Corneal perforation | Diabetic, rheumatoid arthritis |
| 64 | 63/female | Asymptomatic | Elective | Cataract | Diabetic |
| 65 | 72/male | Asymptomatic | Elective | Cataract | Medically free |

Table 3: Summary of the previously published studies

| Author | Sample size | Number of positive cases, n (%) | Number of asymptomatic cases, n (%) |
|--|-------------|---------------------------------|-------------------------------------|
| Al-Essa and Alkharashi ^[10] | 727 | 17 (2.3) | 17 (100) |
| Kannan <i>et al.</i> ^[11] | 413 | 9 (2.2) | 9 (100) |
| Gruskay <i>et al.</i> ^[12] | 99 | 12 (12.1) | 7 (58.3) |
| Singer <i>et al.</i> ^[13] | 4751 | 14 (0.3) | 6 (42) |

of documentation. Furthermore, the study was performed in one department in a single center which might underestimate or overestimate the frequency of COVID-19 during Omicron outbreak and may not be generalizable to other geographic regions.

CONCLUSION

The study showed that almost 1 in 13 patients scheduled for elective or emergency ophthalmic surgeries may be positive for the COVID-19 during Omicron outbreak. All positive cases were asymptomatic at the time of swabbing, highlighting the importance of routine preoperative screening for COVID-19. The preoperative screening for COVID-19 can help ophthalmologists to postpone elective procedures in patients with positive tests given the risk of perioperative complications and the possibility of transmission of the virus to health-care workers.

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Conflicts of interest

There are no conflicts of interest.

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