Original Article

Preoperative universal screening for COVID-19 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) 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 June 1, 2020, and October 31, 2020, in a single tertiary eye care center in Riyadh, Saudi Arabia. All patients who were given appointments for elective or emergency surgeries were included in the study. All patients underwent preoperative nasopharyngeal and oropharyngeal reverse transcription-polymerase chain reaction testing for severe acute respiratory syndrome coronavirus-2 virus. Retrospective chart review of all patients who tested positive for COVID-19 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 727 patients were scheduled for elective or emergency ophthalmic surgeries during the study period. The mean age of all patients was 61.3 years, 407 were males (55.9%) and 320 were females (44.1%). Of 727 patients tested for COVID-19, the test was positive in 17 (2.3%) patients. All patients who tested positive for COVID-19 were asymptomatic at the time of swabbing. No patient-related perioperative complications or health-care workers' affection secondary to exposure to positive cases were documented.

CONCLUSION: The study showed that almost 1 in 43 patients scheduled for elective or emergency ophthalmic surgeries may be positive for COVID-19. All positive cases were asymptomatic at the time of swabbing, underscoring the importance of the routine preoperative screening for COVID-19.

Keywords:

Asymptomatic, coronavirus, coronavirus disease-2019, severe acute respiratory syndrome coronavirus-2, screening

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] As of 19 December 2020, the number of confirmed COVID-19 cases is more than 75 million and nearly 1.6 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 government implemented several measures to slow down the spread of the disease in early March including closure of schools, universities, and commercial centers; promoting social distancing measures; and applying restrictions on dining in restaurants. In late March, the Saudi government imposed a curfew including transportation restrictions, suspension of workplace attendance, and cessation of all domestic and international flights

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aiming to prevent further spread of the virus. On June 21, the lockdown was lifted in sequential phases as the number of new COVID-19 cases decreased and the recovery rate increased. At the time of writing the manuscript, the total number of positive COVID-19 cases in Saudi Arabia is 360,000 cases resulting in 6000 deaths.

COVID-19 global pandemic has resulted in cancellation of a substantial number of elective surgeries across the world. Several agencies and expert groups recommended to postpone elective procedures since patients with COVID-19 have a higher risk developing perioperative complications with an increased rate of mortality compared to patients without COVID-19.[5,6] As a result, our tertiary eye care center decided to decrease its surgical volume and to only perform acute ophthalmic surgeries since March 9. As the country started gradually to re-open in late June, 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. The purpose of this study was to determine the frequency of COVID-19 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 June 1, 2020, and October 31, 2020. We included all patients who were given appointments for elective surgeries or admitted for emergency surgeries during the study period. 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 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 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 till 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 an 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 version 24 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented using percentages and frequencies.

Results

Between June 1, 2020, and October 31, 2020, a total of 727 patients were scheduled for elective or emergency ophthalmic surgeries in our center. The mean (standard deviation) age of all patients was 61.3 (10.4) years, 407 were males (55.9%) and 320 were females (44.1%). Overall, 17 patients (2.3%) tested positive for COVID-19. Table 1 shows the number of scheduled surgeries, number of positive COVID-19 cases, and average number of COVID-19 cases in Riyadh by month.

The frequency of asymptomatic COVID-19 infection was calculated as 2.3% (17 out of 727 patients). Table 2 summarizes the demographic and clinical data of these patients. Of the 17 patients with a positive COVID-19 test result, the surgical intervention was performed in five patients (four traumatic open globes and 1 keratolysis secondary to rheumatoid arthritis) prior to the release of the swab results. These five patients were considered as 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 with COVID-19 virus secondary to exposure to these patients. The remaining 12 patients were basically scheduled for elective surgeries that were postponed till they get cleared from the virus. 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 among patients scheduled for elective or

Table 1: The number of scheduled surgeries, number of positive COVID-19 cases, and average number of COVID-19 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[7]
June	63	3	865
July	97	5	216
August	106	2	68
September	194	6	36
October	267	1	33
Total	727	17	244

Table 2: The demographic and clinical data of patients who tested positive for COVID-19

Patient number	Age/gender	Status	Urgency of surgery	Diagnosis	Systemic diseases
1	35/male	Asymptomatic	Emergency	Open globe + intra-ocular foreign body	Hypertensive
2	26/male	Asymptomatic	Emergency	Open globe	Medically free
3	57/male	Asymptomatic	Emergency	Open globe	Medically free
4	39/male	Asymptomatic	Emergency	Open globe	Medically free
5	56/female	Asymptomatic	Emergency	Keratolysis secondary to rheumatoid arthritis	Diabetic, rheumatoid arthritis
6	18/female	Asymptomatic	Elective	Cataract	Diabetic
7	50/female	Asymptomatic	Elective	Cataract	Medically free
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	13/male	Asymptomatic	Elective	Traumatic cataract	Medically free
16	71/male	Asymptomatic	Elective	Vitreous Hemorrhage	Diabetic, hypertensive
17	55/male	Asymptomatic	Elective	Cataract	Lymphoma (on remission), hypertensive

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 COVID-19.

Our study showed a COVID-19 frequency of 2.3% and none of the positive patients reported any of the COVID-19 symptoms. 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 were symptomatic.[8] 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%.[9] 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.[10] Table 3 summarizes the findings of the previously cited studies.

By observing the numbers reported by the Saudi Ministry of Health,[7] we did not find an association between the number of COVID-19-positive patients in each month in our study with the monthly average number of positive cases in Riyadh city. One possible explanation is that asymptomatic patients do not seek medical attention, hence, underestimating the actual 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.[11] Another study showed that 30.8% of individuals who tested positive for COVID-19 were asymptomatic at the time of testing.[12]

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.[13,14]

Multiple reports documented that thousands of health-care workers have been infected with COVID-19 due to transmission from asymptomatic patients despite adherence

Table 3: Summary of the previously published studies

Author	Sample size	Number of positive cases (%)	Number of asymptomatic cases (%)
Kannan *et al*.[8]	413	9 (2.2)	9 (100)
Gruskay *et al*.[9]	99	12 (12.1)	7 (58.3)
Singer *et al*.[10]	4751	14 (0.3)	6 (42)

to infection control measures.[15,16] Moreover, several articles highlighted the great risk of COVID-19 transmission to health-care workers from asymptomatic patients.[17-19] 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.[5] In addition, another study showed that performing elective surgeries for patients with COVID-19 is associated with COVID-19 disease progression and increased rate of mortality.[20] Thus, it may be advisable to postpone nonurgent cases in COVID-19-positive patients.

There are several limitations to our study. The data were collected retrospectively and were dependent on the quality of documentation. Furthermore, the study was performed in one department in a single center which might underestimate or overestimate the frequency of COVID-19 and may not be generalizable to other geographic regions.

Conclusion

The study showed that almost 1 in 43 patients scheduled for elective or emergency ophthalmic surgeries may be positive for COVID-19. All positive cases were asymptomatic at the time of swabbing, underscoring the importance of the 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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