



Ophthalmology Practice Amidst COVID-19 in Africa, The Experience from Uganda

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Abstract

The COVID-19 pandemic disrupted clinical practice all over the African continent. Ophthalmology is a high-risk profession due to the ease with which physicians are exposed to patients' secretions. Lockdown measures to stop the spread of the virus, disrupted ophthalmological care and services, residence programs were abruptly shut down. In this paper we review the literature indexed in PubMed with search terms "ophthalmology", "COVID-19", and "Africa or specific African country". Concerning the impact of the COVID-19 pandemic on ophthalmological practice in Africa in order to identify the adaptations made and challenges faced unique to this region. The experience from the national ophthalmological referral unit in Uganda concerning patient care and ophthalmological training is specifically highlighted. Knowledge of these experiences would help ophthalmology units in these regions adapt better if a similar pandemic occurred in the future. Ophthalmology practice and training was greatly affected due to the lockdown measures instilled to curb spread of COVID-19 infection and limitation of resources to support required preventive measures. COVID-19 booster vaccination and adequate Personal Protective Equipment (PPE) for high-risk workers such as those in ophthalmology should be maintained. Appropriate technology for online learning and telemedicine should be integrated in ophthalmology institutions in order to avoid disruption of learning and patient care.

Keywords: Ophthalmology; COVID-19; Africa; Uganda; Training

Introduction

The COVID-19 pandemic starting in Wuhan, China subsequently spread to the rest of the world, requiring the lockdown of billions of persons to stem its spread [1]. This led to the closure of institutions of learning, adversely affecting graduate medical education with the discontinuation of face-to-face lectures, clinical rotations and elective surgeries barring emergencies [2]. Ophthalmology is considered a high-risk specialty due to close physical interaction with patients during ocular examination and surgeries with the potential of contracting the virus through respiratory and conjunctival secretions, confounded by the high patient numbers in the outpatients' clinics [3]. COVID-19 ocular manifestation have been found to be uncommon in published literature however when they occur, they present as conjunctivitis symptoms including eye redness, ocular irritation, foreign body sensation, tearing, and chemosis [4]. Many publications have been written about the effect of the COVID-19 pandemic on the practice of ophthalmology in China, the United States and Europe but so far very little has been published about Africa [5-8]. In this paper we reviewed the literature about the impact of the COVID-19 pandemic on the practice of ophthalmology in Africa and describe our experience as ophthalmologist at a major national referral hospital in Uganda.

Methods

We searched for articles indexed in PubMed until September 17th, 2022. Search terms used included "ophthalmology", "COVID-19", and "Africa or specific African country". All types of articles were included in our review. Papers were reviewed by two authors (JO and RC). In addition, we reviewed the medical records of the ophthalmological outpatient clinic at the Mulago National Referral Hospital in Kampala and present our experience with training of residents in ophthalmology in Uganda.

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Results

Literature review

There were nine publications identified, two were “opinion type” of paper [9,10] and another an editorial about safety recommendations during ocular surgery [11]. And a case report from Ethiopia in which a patient presented with severe COVID-19, new onset diabetes mellitus and a Rhino-orbital-cerebral mucormycosis while on steroid therapy [12]. Only five were original research papers [13-17].

The first research paper describes the results of an online survey in May 2020 among 823 eye care practitioners in Nigeria concerning their knowledge about COVID-19 and ophthalmological practice during the pandemic [17]. Eye care practitioners in Nigeria were found to have good knowledge about COVID-19 and they continued to provide eye care services during the COVID-19 lockdown in Nigeria, despite that the majority of them did not receive any training on the use of personal protective equipment. The authors conclude that the government of Nigeria should improve and extending the training on standard infection prevention and control measures among eye care practitioners. The second paper from Nigeria studied the impact of COVID-19 on attendance at an ophthalmic outpatient service by comparing the attendance in a similar period, January 2020 to August 2020 and January 2019 to August 2019. They found an overall decline of 46% to 76.3% [15].

The third research paper describes the results of an online survey among 35 Moroccan ophthalmologists concerning the impact of COVID-19 on their consultation activities [13]. The survey showed that 88.57% of them maintained their consultation activities; however, 75% only treated urgent cases or patients whose condition required undelayed management. The majority of ophthalmologists reported a decrease in consultations of at least 90%. Most ophthalmologists believed that the risk of becoming infected or infecting their patients ranged from medium to high despite using protective barrier methods.

The fourth research paper was a cross sectional observational analytical assessment of the impact of the COVID-19 pandemic on ophthalmology practice among 250 ophthalmologists in the metropolitan area of Cairo, Egypt. Most (82% response rate) were concerned about the economic impact of considering the restriction

in patient flow to 60% to 80% and the accompanying 80% to 100% in surgical load. Most had access to personal protective equipment and were following the recommended safety protocols especially when performing elective surgeries [16].

The fifth research article is from a cross sectional survey among 40 ophthalmology residents doing their internship in Tunisia in order to evaluate their level of satisfaction in regards to clinical case study-based e-learning [14]. The online survey followed four months of e-learning *via* the Moodle online learning platform, it was found that all respondents were satisfied with the clinical cases presented through the platform and 97.5% considered the teaching method to be respondent to their training needs with a statistically significant difference in the level of knowledge. This study showed that e-learning could be appropriately integrated into ophthalmology training with reduction in issues of patient availability and case exposure.

Uganda ophthalmological patient care during COVID-19

In the first week after initiating a lockdown in Uganda in March 2020 [18] Ophthalmic Clinical Officer (OCO) clinics and specialist consultation clinics at Mulago hospital in Kampala experienced a reduction in patient load from 1293 to 197 in April 2020 (Figure 1). However, with the strict enforcement of the curfew, we saw an increase in the number of trauma related ophthalmic emergencies resulting from domestic violence and violence by security forces as shown by the trauma related diagnoses in Figure 2 [19,20]. The ban on public transport affected both patients and health care workers accessing health facilities leading to late presentation and management of ophthalmic emergencies. This trend lasted until the partial lifting of the lockdown months later with an increase in the number of outpatient cases as public transport opened up from 68 to 686 patients in July 2020 (Figure 1).

The frequent handwashing practice was quickly adapted within the city of Kampala leading to a reduced number of patients (only 10 in month of April 2020) presenting with infectious conjunctivitis, which was relatively frequent (at least five a day) in ophthalmological clinics prior to the COVID-19 pandemic. Patients with chronic diseases such as glaucoma and ocular tumors were also affected by the COVID-19 mitigation measures such as closure of the ophthalmology clinic for non-emergencies, ban of public transport. Certain patients

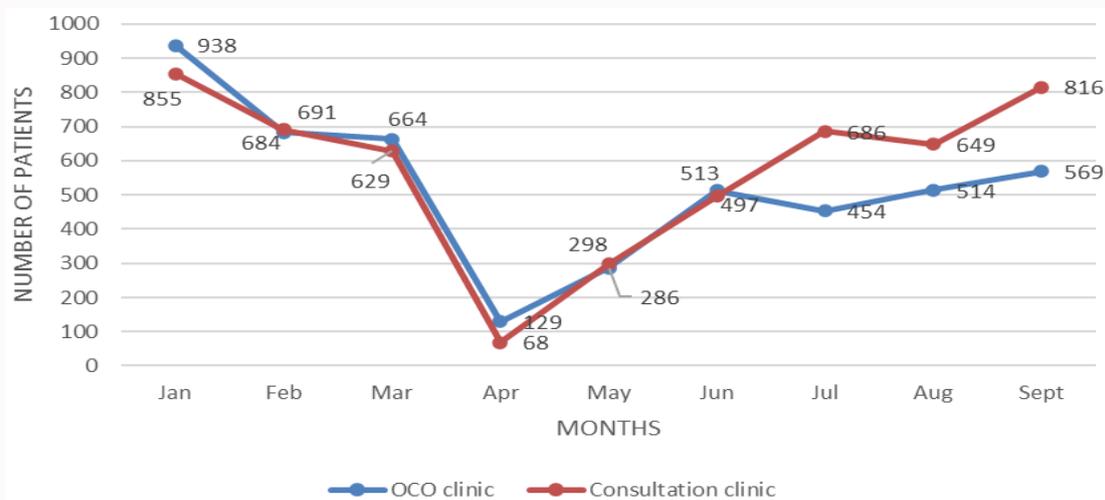


Figure 1: A line graph showing number of patients visiting the ophthalmic outpatient clinics in Mulago National Referral Hospital, Kampala Uganda, during the lockdown period (March 2020 to August 2020).

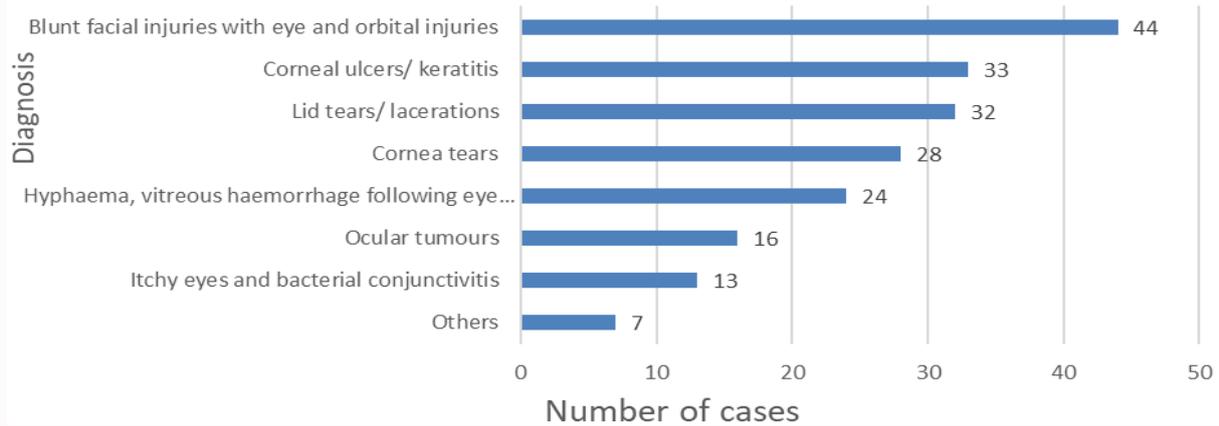


Figure 2: A bar chart showing types of ophthalmological pathology treated at the ophthalmic outpatient clinics in Mulago National Referral Hospital, Kampala Uganda at the height of the lockdown in April 2020 (n=197).

*Others (Angle closure glaucoma 3, Central retinal artery and vein occlusion 1, Vitreous hemorrhage 3)

were also afraid of contracting COVID-19 disease at the clinic given than Mulago hospital was a designated COVID-19 treatment center. Therefore, they are bound to present with further progression of their illnesses.

As routine elective surgeries resumed in May 2020, we observed an increased risk of contamination of eye and topical eye drops used post-operatively due to mandatory mask wearing. The majority of patients use reusable cloth masks that are not washed regularly and are often used inadvertently to clean excessive tears after surgery and also may contaminate the eye drop tops as patients apply their postoperative medication.

Makerere University Medical School is located within Kampala, as the capital city and center of trade, it is the COVID-19 epicenter with a cumulative case load of 9,442 and 85 deaths as of October 07th, 2020 [21]. Mulago hospital which is the teaching hospital for the medical school has installed hand washing stations at all clinics and wards, with signages reminding people of its importance. It was also mandatory to wear a mask, and a thermal temperature check was performed prior to entry into and within the hospital premises. Appropriate personal protective wear and alcohol-based sanitizers were provided for the residents and teaching staff. Appropriate personal protective wear and alcohol-based sanitizers have been provided for the residents and teaching staff. However, initially after resumption of elective surgeries, a COVID-19 test for surgical patients was not required due to the cost implications as advised by the ministry of health.

Residency training

Trainees in ophthalmology have been negatively affected by the pandemic especially their surgical training. We have a total of 25 residents of which 16 are Ugandans and 9 are foreign nationals from Tanzania and Somalia. Some of the foreign nationals returned home at the start of the lockdown period due to uncertainty of reopening dates and absence of financial support. In the early stages of lock down the university quickly responded by creating an online teaching platform called the Makerere University E-learning Environment (MUELE). All faculties were tasked to upload content and use this platform for continued learning. We were able to continue teaching all students using this platform. In addition, we reached out to our collaborators at University of Toronto and were given access to their Zoom

lectures and webinars. This supported the residents learning through this period. However, most of their hands on surgical experience is acquired during elective procedures which were postponed by patients fearing of contracting the virus at the hospital and because of “shelter in place” related movement restrictions [22]. In addition, data collection for those writing their thesis was delayed until public transport resumed. The University considered all these constraints and scheduled examinations in a phased manner when all the relevant curriculum content had been covered.

Discussion

So far very little research has been done concerning the ophthalmological manifestations of COVID-19 infection in Africa and the effect of the COVID-19 pandemic on the practice of ophthalmology and training in ophthalmology. The course of the COVID-19 pandemic in sub-Saharan Africa seems to progress differently compared to Europe and America. Moreover because of a lack of resources, international recommendations for ophthalmological care often cannot be implemented in many parts of Africa. Our study in Uganda shows that an ophthalmologist in Africa may be confronted with different challenges compared to high income countries such as post-operative eye infections caused by contaminated eye drops or because of wearing dirty face masks. Important to note is the increase of traumatic eye lesions because of increased violence (domestic but also by police law enforcement) often associated with increased alcohol use during the lockdown [23,24].

Physicians are encouraged to follow the guidelines by the International Council of Ophthalmology encouraging practitioners to wear masks, have one attendant per patient, have a screening desk and hand washing station, disposable theatre gowns when possible [25]. Equipment such as slit lamps and slit lamp shields, tonometers should be sterilized with 70% ethyl alcohol and 10% diluted hypochlorite solution respectively after every patient. Lastly, they should educate patients about early identification of symptoms (fever, cough or shortness of breath) and essential preventive actions. Postoperative patients should be provided with clean disposable masks in the immediate post-operative period. Patient own cloth masks should not be allowed within the operating room to reduce risk of mask associated infections. All health workers are encouraged to

self-report any symptoms and have appropriate testing done allowing for isolation and contact-tracing to undertaken as deemed necessary.

Reduced clinical ophthalmological activities because of COVID-19 mitigation measures are a challenge for ophthalmological training programs. Several guidelines have been issued to help programs cope with the uncertainty and risk brought on by COVID-19 [26,27]. Training programs should make use of teleconferencing to deliver didactic lectures through platforms such as Zoom, Microsoft Teams or Google Meet. Residents in clinical rotations should be divided up to ensure appropriate coverage of outpatient's clinics which themselves should be reorganized to ensure the safe practice with hand hygiene facilities and adequate protection kits for the healthcare personnel. Surgical education can continue in this era of reduced volume of patients allowing better preoperative preparation, in-depth discussion of the intricacies of particular procedures allowing residents learn more knowledge from each case given that time constraints are removed with the decrease in patient numbers. Interventions could also be scheduled during weekends to make up for the time lost. Students are further encouraged to take advantage of this time to study and engage in other academic activities such grant writing, clinical research and completion their thesis for those in the final years.

Following the end of the lockdown measures to curb COVID-19 spread, ophthalmology practices have reduced clinical scheduling, and have made other adaptations to continue providing clinical care. These include screening both patients and HCW for fever prior to entering clinics. Large breath shields are installed on slit lamps between a patient and the ophthalmologist. Patients and health care workers are encouraged to mask up. To further reduce the infectious risk during surgical cases, surgical sites have preoperative COVID-19 testing and strengthened the PPE supply chain [28].

Conclusion

So far, the COVID-19 pandemic seems to have caused less COVID-19 related morbidity and mortality in Africa compared to other parts of the globe. However, the measures instituted to curtail the spread of COVID-19 caused considerable collateral damage including in the domain of ophthalmological care. It is important that essential ophthalmological care and services are not interrupted and that also ophthalmological training should continue. It is however important that these services are offered in a safe way for the eye-care practitioners and the patients and vaccines are made available to the health workers. Therefore, more knowledge is needed regarding the risk of contracting COVID-19 in ophthalmic surgeries, and transmission risk from ocular surface preparation techniques and contact with conjunctiva and intraocular fluids.

COVID-19 booster vaccination and PPE for high-risk workers such as those in ophthalmology should be maintained. Technology for online learning and telemedicine should be integrated in ophthalmology institutions in order to avoid disruption of learning and patient care.

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