Experience of a Vitreoretina Clinic in a Tertiary Ophthalmology Referral Center in Indonesia during COVID-19 Pandemic 2020

Andi Arus Victor[1]

[1]RSCM

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Abstract

Background: Coronavirus (COVID-19) pandemic has brought adjustments to ophthalmology clinics, especially vitreoretinal clinics where examinations and procedures are performed in close contacts. Screening and surgery prioritization policy are essential to maintain safety for medical personnel and patients. Aim: To present implementation of screening and surgery prioritization policy in a tertiary ophthalmology referral center in Indonesia. Methods: Safety protocol was implemented in Kirana Eye Center, Cipto Mangunkusumo Hospital, Jakarta, Indonesia from April 2020 to prevent COVID-19 spread. Initial screening consisted of temperature checking, hand hygiene, and questionnaire of COVID-19 signs and symptoms, was performed to patients and caregivers. Those with sight-threatening emergencies were prioritized. Sight-threatening surgical cases were also prioritized. Records of patients in vitreoretinal clinic and operating room were taken on April 2020. Data on diagnosis and procedures was analysed. Results and discussion: There were drastic declines in the number of patients allowed entry to the clinic and patients underwent surgery. There was approximately 80% decrease of patients coming into the clinic with total of 314 patients during March 2020. Most of these patients were pre-existing patients followed up after surgery, patients with diabetic retinopathy and retinal detachment (RD). Most cases managed surgically were RD. Most carried out procedure was vitrectomy, endolaser, and silicone oil tamponade. Conclusion: Our protocol of safety has been successful in reducing patients coming in to our facility but still manage to treat those with sight-threatening conditions. Our protocol may be a model for developing countries. Keywords: COVID-19, vitreoretinal clinic, public health, health policy Word count: 248

Introduction

Coronavirus affects global population with current total number of cases reaching more than 3.200.000 people with more than 200.000 deaths worldwide.11 The virus mainly manifests as respiratory tract disease firstly identified as an pneumonia of unknown etiology in Wuhan, China. The virus was then recognized as a RNA virus with similarity to previous severe acute respiratory syndrome coronavirus (SARS-CoV) and hence named as SARS-CoV 2, widely known as coronavirus disease 2019 (Covid-19).22,33 World Health Organization has declared Covid-19 as international health concern and urged preventive measures to be implemented worldwide.[1]

Covid-19 is predominantly transmitted via droplets containing virus.44 However, studies have also shown possible transmission via aerosol.55 The virus can also stay up to several hours on few materials. Hence, proper measures should be taken to prevent further transmission of the virus. Countries worldwide have implemented various policies from physical and social distancing to nation-wide lockdowns to prevent mass gathering hence reducing transmission to flatten the curve. These call for several adjustments in the health-care system as many hospitals are overwhelmed with surges of patients in need of isolation and a dramatic rise in usage of personal protective equipment (PPE).

Many healthcare facilities and clinics urge patients to stay at home and visit during emergency conditions only. This became challenge especially in developing countries such as Indonesia. Placed as fourth most

populous country in the world, added with limited health facilities and personnel, Indonesia was forced to adapt during this pandemic era. A study from clinical microbiology laboratory of Universitas Indonesia showed that from March to April, the laboratory has tested 4,617 samples with 12.6% positive rate and 22% asymptomatic case.66 Current local statistics up to August 2020 from the Indonesian Ministry of Health showed that nation-wide confirmed cases have reached more than 141,370 cases with more than 6,207 deaths.77 Without proper preventive measures, number of positive cases is threatened to increase.

The Ministry of Health along with the local Medical Doctor Association emphasized the importance of physical distancing in clinics, hospitals and other healthcare facilities. Restrictions on outpatient clinics and non-emergency cases were imposed nation-wide, including ophthalmology clinics. Such adjustments are often difficult especially in vitreoretinal clinics as physical examinations are mostly done in close contact. Many of vitreoretinal cases are sight-threatening that requires routine visits, urgent and emergency treatment including surgery. Here, we would like to present our example of implementing screening and surgery prioritization policy in a tertiary ophthalmology referral center in Indonesia.

Methods

Time and Place

Adjustments according to the new policy was made from March 2020 onwards. Data was taken from April 2020 in Kirana Eye Center, Jakarta, a national tertiary referral ophthalmology center in Indonesia.

Screening Procedure

Outpatient Clinic

Screening was performed upon all patients coming to Kirana Eye Center every day. This was done by one ophthalmologist, two ophthalmology residents and two ophthalmology trained nurses, all dressed in appropriate level 3 PPE. The screening team were instructed to assume all coming patients as suspects of Covid-19 thus, taking appropriate measures. History taking and physical examination was done on separate triage room before patient could continue to outpatient clinic. Patients were limited to 150 patients each day for outpatient clinic. Every incoming patients and accompanying persons would be screened for signs and symptoms of Covid-19 including cough, fever, shortness of breath, history of travelling to high risk places, and close contact to people with symptoms similar to Covid-19 or diagnosed with Covid-19. Those fulfilling criteria such as (1) new referral cases, (2) previously existing patients with worsened complaints, (3) patients with sight threatening conditions can continue to outpatient clinic. Patients who do not require immediate treatment would not be admitted further, given their routine medication and scheduled to visit on another time. Patients with symptoms suggestive of Covid-19 and / or close contact with Covid-19 suspects or diagnosed patients will not be admitted and would be referred to pulmonology clinic for further Covid-19 screening.

Extra precautions were taken such as placing special plastic shield in every slit-lamp biomicroscopes in our facility, routine disinfection of rooms and equipment, implementing physical distancing in the waiting room by designating a “no sitting zone”, and restricting the number of visitors in the ward (Figure 1).11

Figure 1. Safety measures taken in our eye center. (Left) waiting room; (right) slit lamp with plastic shield

Surgery

Patients prioritized for vitreoretinal surgery are those with sight threatening emergencies, trauma and cases such as:

1. Rhegmatogenous retinal detachment (RRD) with less than three months of onset
2. Trauma with intraocular foreign body
3. Endopthalmitis
4. Nucleus drop
5. All cases involving last functional eye

Patients fulfilling above criteria for surgeries would be referred for a Covid-19 rapid test and in addition, those with general anaesthesia would be asked to visit internal medicine clinic for Covid-19 screening. Patients could be scheduled after they obtain clearance of Covid-19 suspicion by a non-reactive rapid test result and clearance from the internal medicine department.

Data collection and processing

Data was collected on May 2020. Data of patients screened each day for outpatient clinics along with priority cases scheduled for surgery each day were recorded, including standard demographic characteristics such as name, age and sex, along with diagnosis. Data were then entered and processed using SPSS ver.25.

Results

The policy of outpatient screening and surgery priorities was implemented starting from March 1st, 2020. There were drastic declines in the number of patients allowed entry to the clinic. Patients without urgent complaints or worsening vision were discharged with medications. **Table 1** shows proportion of new and pre-existing cases in Kirana Eye Center Cipto Mangunkusumo Hospital on April 2020. Most cases were pre-existing cases with 21.7% of new cases.

Table 1. Proportion of New and Pre-existing Case in Kirana Eye Center Polyclinic during Covid-19 Pandemic

Case	**N**	**%**
New	68	21.7%
Pre-existing	246	78.3%
Total	**314**	**100%**

Table 2 summarizes all cases in Kirana Eye Center during the COVID-19 pandemic. We show that majority of cases was post-surgery follow-up (40.1%) followed by diabetic retinopathy (17.5%) and retinal detachment (15.9%)

Table 2. Proportion of Cases Admitted to Kirana Eye Center Polyclinic during Covid-19 Pandemic (April 2020)

Diagnosis	**N (%)**
Post surgery follow up	126 (40.1%)
Diabetic retinopathy	55 (17.5%)
Retinal detachment	50 (15.9%)
Vitreous haemorrhage (VH)	30 (9.6%)
Age-related macular degeneration (AMD)	16 (5.1%)
Sillicone filled eye	10 (3.2%)

Diagnosis	**N (%)**
Retinal vein occlusion	8 (2.5%)
Secondary glaucoma due to emulsified silicone oil	6 (1.9%)
Complicated cataract	3 (1.0%)
Lens drop	2 (0.6%)
Macular hole	2 (0.6%)
Posterior uveitis	2 (0.6%)
Central serous retinopathy	1 (0.3%)
Choroidal detachment	1 (0.3%)
Intraocular foreign body	1 (0.3%)
Suprachoroidal haemorrhage	1 (0.3%)
Total	**314 (100%)**

These cases were grouped based on their status of new or pre-existing case. New cases were predominantly retinal detachment (39.7%) followed by VH (19.1%) and age-related macular degeneration (AMD) (13.2%). Most pre-existing cases were comprised of post-surgery follow up (51.2%). Details of these cases are listed in **Table 3** .

Table 3. Proportion of Cases based on New and Pre-existing Cases in Vitreoretina Clinic during Covid-19 Pandemic

Case	**N (%)**
New	**68 (21.7%)**
Retinal detachment	27 (39.7%)
Vitreous haemorrhage	13 (19.1%)
AMD	9 (13.2%)
Diabetic retinopathy	8 (11.8%)
Retinal vein occlusion	3 (4.4%)
Vitreous anomalies	2 (2.9%)
Choroidal detachment	1 (1.5%)
Complicated cataract	1 (1.5%)
Intraocular foreign body	1 (1.5%)
Lens drop	1 (1.5%)
Posterior uveitis	1 (1.5%)
Suprachoroidal haemorrhage	1 (1.5%)
Pre-existing	**251 (77.7%)**
Post surgery follow – up	126 (51.2%)
Diabetic retinopathy	47 (19.1%)
Retinal detachment	23 (9.3%)
Vitreous haemorrhage	14 (5.7%)
Sillicone filled eye	10 (4.1%)
AMD	7 (2.8%)
Secondary glaucoma due to emulsified silicone oil	6 (2.4%)
Retinal vein occlusion	5 (2.0%)
Complicated cataract	2 (0.8%)
Macular hole	2 (0.8%)
Central serous retinopathy	1 (0.4%)
Lens drop	1 (0.4%)
Posterior uveitis	1 (0.4%)
Vitreous anomalies	1 (0.4%)

Case	N (%)
Total	**314 (100%)**

Prioritized surgical cases are listed in **Table 4** . Most surgical cases during Covid-19 pandemic were retinal detachment, which comprised 83.3% of all cases. Procedures carried out for cases on **Table 4** are listed in **Table 5** .

Table 4. Proportion of Cases Managed Surgically during Covid-19 Pandemic in Kirana Eye Center

Diagnosis	N (%)
Retinal detachment	55 (84.6%)
Vitreous haemorrhage	4 (6.2%)
Lens drop	2 (3.1%)
Silicone filled eye	2 (3.1%)
Choroidal detachment	1 (1.5%)
IOFB	1 (1.5%)
Total	**65 (100%)**

Table 5. Proportion of Surgeries in Kirana Eye Center during Covid-19 Pandemic

Procedure	N (%)
Vitrectomy, endolaser, silicone oil	41 (63.0%)
Vitrectomy, endolaser, C3F8 gas	7 (10.6%)
Vitrectomy, endolaser	3 (4.5%)
Silicone oil evacuation	2 (3.1%)
Vitrectomy, scleral buckle, endolaser, silicone oil	4 (6.2%)
Vitrectomy, endofragmentation	2 (3.1%)
Scleral buckle, dexamethasone injection	1 (1.5%)
Scleral buckle, SF6 gas, cryotherapy	1 (1.5%)
Vitrectomy, anti-VEGF injection	1 (1.5%)
Vitrectomy, endolaser, C3F8 gas, scleral buckle	1 (1.5%)
Vitrectomy, endolaser, C3F8 gas, scleral buckle, triamcinolone injection	1 (1.5%)
Vitrectomy, internal limiting membrane peeling, endolaser, silicone oil,	1 (1.5%)
Vitrectomy, endolaser, silicone oil, secondary implant	1 (1.5%)
Vitrectomy, IOFB extraction, intravitreal antibiotic injection	1 (1.5%)
Total	**65 (100%)**

Discussion

This study offers the perspective of a tertiary national referral eye centre of a third world country with one of the most 'unequipped' government in the world during the COVID-19 pandemic. We showed the local response to the COVID-19 pandemic, and how to implement safety measures with limited equipment and resources, while still serving as a tertiary referral centre for ophthalmologic cases in Indonesia. Normally, our vitreoretinal clinic serves more than 100 cases on a daily basis, not to mention other divisions. However, during this COVID-19 pandemic, we reduced the number of outpatients, surgical interventions and admission to the bare minimum, with heavily emphasizing the screening procedure and usage of personal protective equipment. Lu, et al11 mentioned that transmission of COVID-19 can occur via ocular surface hence

increased risk for ophthalmologists. We have adjusted our usual ophthalmology care according to guidelines from American Academy of Ophthalmology (AAO).22

During the COVID-19 social distancing policy, our clinic managed to reduce the number of outpatient visits from approximately 2000 cases monthly to 314 cases in March 2020. This represent a more than 80% reduction as compared to the normal monthly outpatient visits. We subject each patient to a screening process using a makeshift triage prior to entry to the clinic. Furthermore, cases are strictly controlled based on the urgency of the ocular condition and pathology. Majority of the outpatient visits were post-operative follow up, diabetic retinopathy and retinal detachment. Most post-operative follow ups were scheduled prior to the hospital policy, hence the large number of cases. Patient exhibiting good improvement in the ocular condition after operation and the first follow up, were advised to postpone their next appointment or were prompted to use telemedicine. Patients with other diagnosis were also allowed entry, if they were diagnosed with a sight threatening condition such as diabetic retinopathy, retinal detachment, or other conditions with similar urgencies. The diagnosis for each new patient was obtained from a referral letter from an ophthalmologist, diagnosis by other medical practitioners with a high suspicion for the proposed condition or patients presenting at the triage exhibiting appropriate signs and symptoms. Pre-existing patients were diagnosed, categorized and evaluated based on the previous ocular condition and pre-existing comorbidities using their existing medical record. Patients with one eye, ocular emergencies and sight threatening conditions were prioritized entry for evaluation and rapid management while those with less severe ocular pathologies were postponed indefinitely. Using these criteria, we managed to reduce the number of outpatient visits by a significant amount. In March 2020 alone, only 68 new outpatient visits were recorded, while 251 others were pre-existing patients. These restrictions serve to reduce the number of patients waiting in the waiting room and limit human – to – human interaction.

Beside outpatient visits, we also strive to reduce the number of unnecessary medical procedures. A total of 66 procedures were recorded in April 2020, more than 50% decrease from 141 procedures carried out in March 2020 before the policy was implemented. Retinal detachment remains the largest contributor of ocular pathology that require surgical intervention in our vitreoretinal clinic, with 83.3% patients. Most of the procedures performed were vitrectomy, endolaser, silicone oil insertion which comprised more than 50% of the procedures. This is the preferred surgical interventions for retinal detachment cases which are sight-threatening and require immediate treatment. Cases that were evaluated to be of less severity were postponed with scheduled subsequent monitoring and evaluation. As the number of procedures decline, we manage to reduce the amount of medical personnel, tools, working hours and resources involved on the daily operations. Patients that require immediate surgery, medical emergencies or with sight threatening conditions were prioritized for appropriate intervention. Cases were treated based on their ocular pathology, with rapid management and the aim for a short length of stay and rapid discharge. This helped to reduce the number of days the patients were exposed to the hospital environment.

We also implemented mandatory use of personal protective equipment, based on the area of work of the medical personnel. Zones were established based on the level of risk of transmission of COVID-19. Health personnel who work in the triage and laser room used level 3 PPE with respirator, hazmat suit, goggles, shoe cover and gloves. While those in the clinic and ward were required to use scrubs, hair cap and surgical masks. Those working in the operating theatre were mandated to use level 2 PPE. Those working in the emergency room were required to use minimum level 2 PPE with adjustments to level 3 PPE when handling patients suspected of Covid-19. Both the staff members and patients were encouraged to maintain their personal hygiene, wear personal masks and practice frequent hand washing. Caregivers accompanying the patients were limited to one person. Patients that are admitted into the hospital must first pass the screening process in the special clinic designated by the hospital. These regulations help to control the number of people that come in contact with each other and restricts transmission of COVID-19 with the use of PPE and strict screening.

In conclusion, with strict implementation of PPE, limited number of visitors and categorizing patients into the need-to-treat basis, our clinic managed to reduce the number of patients and procedures to a very low

number. Patients that were allowed entry were those with ocular emergencies or sight threatening conditions that require immediate management. The use of telemedicine and appropriate communication is vital to implement the triage and outpatient system.

As time has progressed into a "new normal" period, adjustments must be made for ophthalmology practice especially in developing countries to prevent further transmission of Covid-19.

Conclusion

Our protocol of safety has been successful in reducing patients coming in to our facility but still manage to treat those with sight-threatening conditions. Our protocol may be a model for other hospitals especially in developing countries.

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