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Ophthalmology practice during COVID-19 pandemic: A survey of Indian ophthalmologists

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Purpose: To assess the ophthalmic practice pattern among ophthalmologists in India amidst the COVID-19 pandemic. **Methods:** An online questionnaire-based analysis was performed among members of the All India Ophthalmological Society (AIOS) and results were analyzed using SPSS software version 20. **Results:** A total of 2253 responses were received. The majority of the participants (72.6%) were between 30 and 60 years of age and were into private practice (64.7%). During the lockdown, over one-third of participant ophthalmologists reported not attending any OPD patients, whereas a majority (64%) provided only emergency ophthalmic services. During the COVID-19 pandemic, <15% surgeries were performed compared to the pre-COVID-19 era by 81% of participants, whereas elective surgeries were performed by only 4.3%. The proportion of participants utilizing telemedicine in ophthalmology showed a two-fold rise from the pre-COVID-19 era (21.9%) to the COVID-19 pandemic (46%). Over half of the participants reported following the AIOS guidelines, reducing clinic hours, use of screening questionnaires, minimizing staff, and use of breath shield on a slit lamp as precautionary measures to reduce the exposure. Over 95% of ophthalmologists were satisfied (score > 5/10) by the AIOS guidelines for ophthalmic practice during COVID-19. **Conclusion:** COVID-19 pandemic has adversely affected the ophthalmic care services across India with telemedicine emerging as a major rescue. The majority of practicing ophthalmologists are satisfied with guidelines provided by AIOS for ophthalmic care during the COVID-19 pandemic and have implemented the same in their setup.

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The sudden emergence of Coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 at Wuhan followed by its rapid worldwide spread led to a declaration of a global pandemic by the World Health Organization (WHO).[1,2] High infectivity of this virus resulted in its rapid spread. Also, high mortality was initially observed due to the unfamiliar disease course and lack of a well-defined treatment algorithm. Various measures like a strict national lockdown, social distancing, and travel restrictions were adopted in the public interest by various countries including India.[3,4] National lockdown, although was helpful in retarding the spread of this deadly virus and allowing time for increasing the preparedness of government and medical fraternity to deal with the national medical emergency, had a huge impact on the life of a common man. The entire focus during the year 2020 was on COVID-19 and this led to neglect and delay in treatment for patients suffering from other medical conditions.[5–8]

Ophthalmology practice was one of the worst-hit medical fields, as a majority of cases require treatment for elective conditions.[5,9] This was detrimental for both the ophthalmologists as well as the patients suffering from various ophthalmic conditions. Various ophthalmologists suffered major financial loss during this era due to the altered clinical practice. Various standard operating protocols (SOP) were formulated for clinical practice in an ophthalmic setup for the safety of both patients and doctors. The All India Ophthalmological Society (AIOS), which is the national ophthalmic organization of India, circulated its guidelines among all its members to ensure the safe delivery of ophthalmic services during the COVID-19 pandemic.[10] However, how exactly patients were triaged, what ocular conditions were being seen, and how clinics were operated by ophthalmologists were still largely up to the physicians' and staff's judgment. In this survey, we aim to assess the challenges faced and practice patterns followed by ophthalmic surgeons of India during the COVID-19 pandemic.

Methods

An online questionnaire-based cross-sectional study was conducted among members of the AIOS after approval from the institutional review board. The study adhered to the tenets of the declaration of Helsinki.

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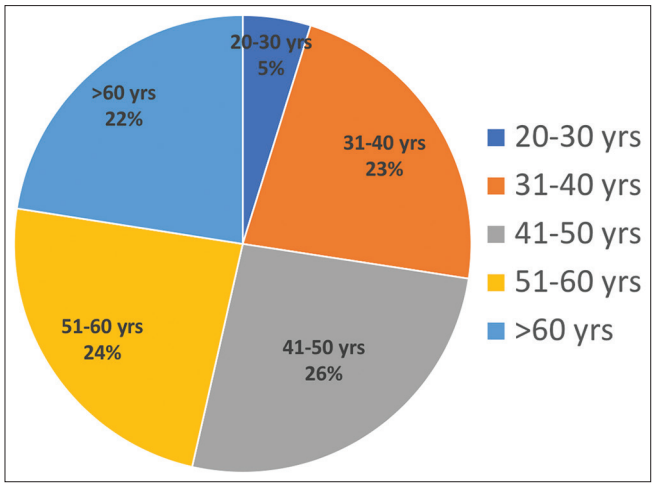

Figure 1: Age composition of the participant ophthalmologists

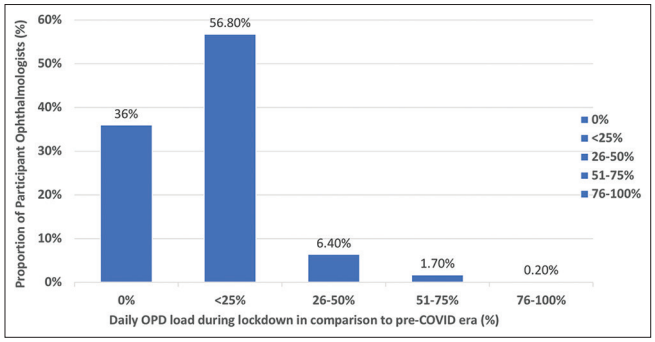

Figure 2: Daily OPD Patient load during lockdown in comparison to pre-COVID-19 era

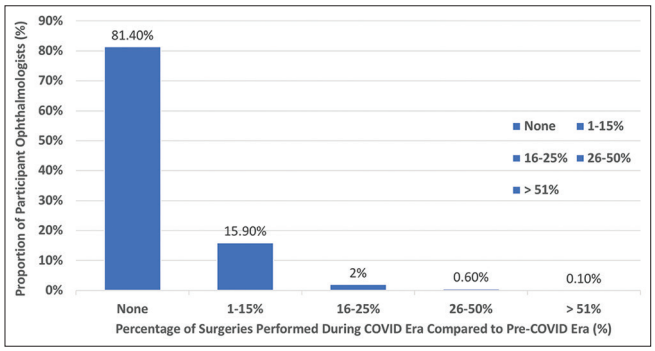

Figure 3: Percentage of surgeries performed during COVID-19 era compared to pre-COVID-19 era

A 23-question survey was developed using the Google sheets (Supplementary Digital Content 1) keeping in view all the challenges posed by ophthalmologists during COVID-19 pandemic. The questionnaire was validated by four experts in the field of Ophthalmology. The questions pertained to the surgeon's demographic details, inpatient care and consultation, practice management, personal impact, and general questions related to challenges faced during the COVID-19 pandemic. The questionnaire was pilot tested on 20 participants who had proficiency in the English language. The questionnaire was revised based on the findings of the pilot study.

A link to the validated questionnaire was emailed to all the members of the AIOS. The email requested members of AIOS to participate in the survey to better understand the ongoing scenario and provide further guidance on unaddressed issues. (Supplementary Content 2) The unique response link allowed completing the survey only once. The responses were collected, and data was exported to an excel sheet. Statistical analysis was performed using SPSS software version 20.

Results

The questionnaire was sent to all the members of AIOS with a registered email address (n-19567). A total of 2253 responses were received; hence, the response rate was 11.5%. The participants included ophthalmologists practicing in varied places, including the public and private sector, solo and group practice, non-government organizations, and corporate hospitals.

Demographic details

The age of the participant ophthalmologists varied from 20 years to > 60 years [Fig. 1]. The age distribution of the participants has been highlighted in Table 1. Three-fourth of the participants were between the age group of 30–60 years, whereas 22% were > 60 years old. The majority were into private practice (65%) followed by Non-government organizations/Trust hospitals, Government hospitals, Corporate chains, and others. An ophthalmic practice experience of >20 years was reported by 49.3% of the participant ophthalmologists. Cataract was the most commonly practiced procedure (67.2%) by the respondents and the majority practiced comprehensive ophthalmology (64.1%). The most commonly practiced ophthalmic specialty included glaucoma (34.8%) followed by cornea/refractive surgery (28.6%), medical retina (24.8%), squint (10.8%), oculoplasty (9.6%), and surgical retina (9.4%) [Table 1].

Inpatient care and consultations

On enquiring about the pre-COVID-19 era's daily outpatient department (OPD) patient load, 41.6% of the participant ophthalmologists reported that they consulted >40 patients/day, whereas 20.8% reported a daily OPD load of >60 patients/day [Fig. 2 and Table 2]. Over one-third of participants reported that they did not attend any OPD consultation during the lockdown period and over half of the participants reported <25% OPD caseload compared to the pre-COVID-19 era. Approximately, two-third of the participant ophthalmologists reported that they provided emergency ophthalmic care and only 16.1% provided routine OPD services during the COVID-19 lockdown. Phone calls (75.3%) and WhatsApp (59.9%) were the major sources of teleconsultation during this period. Only 3.8% of ophthalmologists used "Application-based" consultation for patients. "In-person consultation" of confirmed COVID-19 patients presenting with ophthalmic problems was reported by only 1.5% of the participant ophthalmologists.

Practice management

The majority of the ophthalmologists (81.4%) reported that they did not perform any surgery during the COVID-19 pandemic, whereas others reported a reduced rate of surgeries compared to the pre-COVID-19 era [Fig. 3 and Table 3]. Emergency surgeries were the most commonly performed procedures by

Table 1: Demographic profile of participant Ophthalmologists

Demographic Factor	Percent
Age (years)	
20-30	4.8%
31-40	22.6%
41-50	26.1%
51-60	23.9%
>60	22.5%
Ophthalmic Practice Setup*	
Private practice (single surgeon)	50.4%
NGO/Trust hospital	17.4%
Private practice (Group)	14.3%
Government hospital	10.5%
Corporate chain	9.6%
Freelancer	3.5%
Experience of Ophthalmic Practice (years)	
Currently in training	4.9%
0-10	22.0%
11-20	23.7%
>20	49.3%
Specialty of Ophthalmic Practice*	
Cataract	67.2%
Comprehensive ophthalmology	64.1%
Glaucoma	34.8%
Cornea/refractive	28.6%
Medical retina	24.8%
Squint	10.8%
Oculoplasty	9.6%
Surgical retina	9.4%
Neuro-ophthalmology	7.1%
Pediatric ophthalmology	7.1%
Oncology	1.3%

*More than one responses possible. NGO – Non-government organization

Table 2: The profile of inpatient care and consultation pre- and post-COVID-19 lockdown among the participant ophthalmologists

Ophthalmic Care	Percent
Daily OPD patient load in pre-COVID-19 era	
1-20	17.8%
21-30	19%
31-40	18.9%
41-50	13.3%
51-60	7.5%
>60	20.8%
Daily OPD patient load during lockdown in comparison to pre-COVID-19 era (%)	
0%	36%
<25%	56.8%
26-50%	6.4%
51-75%	1.7%
76-100%	0.2%
Type of ophthalmic care provided during COVID-19 lockdown*	
Routine OPD	16.1%
Refraction	11.1%
IOP checks	11.7%
Laser procedures	5.2%
Emergency OPD	64%
All of the above	6.1%
None	19.4%
Approach to confirmed COVID-19 cases' consultation	
Have not been consulted	87.3%
Remote/Tele-health consultation	5.1%
Phone consultation with Primary Team	4.3%
In-person consultation	1.5%
Method of consultation of non-physical patients*	
Phone	75.3%
Email	7.2%
Video call	16.9%
Application based	3.8%
WhatsApp	59.9%
Do not provide routine care	13.9%

*More than one answer possible. OPD – Outpatient department; IOP – Intra-ocular pressure

the ophthalmologists, which continued to operate during the COVID-19 pandemic, followed by anti-VEGF injection, laser procedures, and elective surgeries [Table 3]. Only 2.1% of participants reported a continuation of all ophthalmic surgeries during the COVID-19 pandemic.

Various measures were taken by the participants to protect their staff. Approximately, half of the ophthalmologists reported following the AIOS guidelines for ophthalmic care during the COVID-19 pandemic and reducing the working hours for all the staff. Separate teams of staff were made for working in shifts by 29% of the participant ophthalmologists to keep reserve staff in case of exposure. The common measures implemented in clinics by participant ophthalmologists to reduce the risk of exposure to COVID-19 virus included reduced clinic hours (69.9%), breath shield on slit lamp (68.6%), minimizing staff (66.9%), physical remodeling of the clinic to favor social distancing (65.1%), and screening of patients with the help of questionnaire or phone call (53.7%) [Table 3]. It was observed that the number of participant ophthalmologists using telemedicine increased from 22% in the pre-COVID-19 era to 46% during the COVID-19 pandemic.

Personal impact

More than half of the ophthalmologists (55.2%) rated an anxiety level of ≥ 3 on a scale of 1–5 (1-low anxiety; 5-high anxiety level) when compared to the pre-COVID-19 era. The major reported stress factors included fear of spreading COVID-19 infection to the patients and family members (36.9%), fear of acquiring COVID-19 infection (25.4%), and financial insecurity (22.4%). Around two-third of the participants foresee a permanent change in their practice/type of employment post-COVID-19.

The majority of participants (66.2%) reported that the AIOS was the most useful source for obtaining ophthalmology-specific guidance in the COVID-19 era.

Approximately, 95% of the participant ophthalmologists reported a satisfaction level of ≥5 on a scale of 1–10 (1-not satisfied; 10-very satisfied) with the AIOS guidelines for Ophthalmic practice in the era of COVID-19 pandemic.

Discussion

The COVID-19 pandemic has had a multi-dimensional impact on the medical fraternity, and ophthalmologists have had their share as well. It has adversely affected the clinical and surgical training of residents, continued medical training of doctors, financial loss to those in private practice, and a physically as well as mentally hostile work condition for

Table 3: Practice management in COVID-19 era

Practice Management	Percent
Number of surgeries performed in pre-COVID-19 era (per month)	
1-20	38%
21-40	24.1%
41-60	13.4%
61-100	11.5%
100-200	8.8%
>200	4.1%
Percentage of surgeries performed during COVID-19 era compared to pre-COVID-19 era	
None	81.4%
1-15%	15.9%
16-25%	2%
26-50%	0.6%
>51%	0.1%
Procedures performed in the past 3 weeks	
Elective surgeries	4.3%
Laser-only surgeries (PI, Capsulotomy, SLT)	5%
Anti-VEGF injections	7%
Emergency only	26%
None	66.6%
All	2.1%
Measures taken to protect your staff*	
Self-isolation	34.5%
Work in separated teams	29.1%
Reduction of working hours	47.8%
Following AIOS Guidelines	55.2%
None of the above	9.9%
Will the COVID-19 pandemic change your future practice behavior?*	
Yes, will incorporate phone/video-consulting	52.3%
Yes, will decrease frequency of physical post-op examination	54.3%
Yes, will adopt bilateral cataract surgery	1.9%
No	25.4%
Precautions implemented at your practice/institution?*	
Reduced clinic hours	69.9%
Screening Physicians/employees in clinic	46.1%
Screening patients with phone call or questionnaire	53.7%
Minimizing staff	66.9%
Physical remodelling to favor social distancing	65.1%
Change in dress code to scrubs only	36.2%
Increased PPE usage	48%
Breath shield on slit lamp	68.6%
Asking patients to wait in car instead of waiting room	26.6%
Have you been using telemedicine as a platform to see patients in last 3 weeks?	
Yes (Large scale)	8.4%
Yes (Limited use)	37.6%
No (But planning to implement)	29.4%
No (Not planning to implement)	24.5%
Did you access telemedicine before COVID-19?	
Yes	21.9%
No	78.1%
If you are an employee on fixed salary, are you willing to*	
Take pay cuts	16.1%
To work extra in post-COVID-19 era	16%
Take deferred payment with financial milestone for 2021	11.9%
Take deferred payment with no financial milestone for 2021	5.9%
Not Applicable	65.9%

*Multiple responses were possible. PI – Peripheral Iridotomy; SLT – Selective laser trabeculoplasty; VEGF- Vascular endothelial growth factor; AIOS – All India Ophthalmological Society; PPE - Personal protective equipment

those working in COVID-19 hospitals in the government setup.[9,11–14] In the current study, we assessed the ophthalmic practice pattern among ophthalmologists in India during the COVID-19 pandemic.

The results of the current survey highlighted that the ophthalmic practice continued to be affected beyond the government-imposed lockdown to curb the spread of COVID-19. While a majority of the participant ophthalmologists reported a drastic decline in the OPD consultations, one-third did not attend any OPD during the lockdown. Emergency ophthalmic care was the only service being provided by a large section of practicing ophthalmologists in these challenging times. Nair *et al*.,[15] in a previous study, reported that 72% of ophthalmologists did not see patients during the COVID-19-lockdown period. The observed difference could be due to the different time periods when these two studies were conducted. Nair *et al*.[15] conducted the study immediately after the first 21 days of lockdown; however, a phase-wise extension of nationwide lockdown could have resulted in a changed practice pattern of ophthalmologists over time. With the lockdown extended in India for approximately 3 months, it is expected that reduced consultations and surgeries for such a long period would have caused a major financial burden to the ophthalmologists in addition to the psychological impact of working amidst these stressful conditions.

Telemedicine in ophthalmology was a relatively less explored arena till the COVID-19 pandemic hit us.[16] However, the results of the current survey showed a two-fold increase in the utilization of telemedicine services from the pre-COVID-19 era. Literature suggests that it helped doctors screen the patients and call for OPD consultation only when the diagnosis was in doubt, thereby reducing the number of physical consultations.[17] The rise in telemedicine was a boon for both the patients and doctors during the challenging time of COVID-19 as physical consultations would have increased the risk of exposure to COVID-19.[18,19] Although application-based telemedicine provides an organized platform for teleophthalmology, the results of the current study suggest that it was used only by a limited number of participant ophthalmologists. The reason for this could be the non-familiarity of doctors as well as patients regarding its use, whereas directly contacting through telephonic call and WhatsApp was much easier for both.

Cataract surgery is the most common ophthalmic specialty practiced by the participant ophthalmologists as observed in the current survey. However, over 80% of the participants reported not performing any surgeries during the COVID-19 pandemic. Elective surgeries were performed only by a handful of surgeons, thereby indicating a huge backlog of cataract surgeries being created in our country. In the coming years, this will have a detrimental impact on the national blindness rate considering that cataract is the most common cause of avoidable blindness in our country.[20] Hence, a revised national strategy will be needed to clear this backlog as soon as the pandemic comes under control, or else the achievement of our country in reducing the blindness rate nearly to the Vision 2020 target will soon be a lost glory.

AIOS guidelines for ophthalmic practice were widely circulated among all its members for guiding the ophthalmic practice during the COVID-19 pandemic.[10] The results of the

survey suggest that majority of the ophthalmologists used these guidelines and found them to be useful in their day-to-day practice. In the current situation, wherein information from different sources may confuse clinicians on the practice protocol, a comprehensive guide by the National Ophthalmic Organization for OPD consultation and ophthalmic surgeries has proved to be helpful.

Various measures to reduce the risk of COVID-19 have been described for healthcare workers working in the current pandemic. In the ophthalmic setup, the common practices as reported in this study were reducing the clinic hours, working hours of staff, and an overall number of working staff. Physical remodeling of the clinic set-up to implement social distancing, use of screening questionnaire for patients, and use of breath shields in slit lamp were the other common practices to reduce exposure to COVID-19.

Psychological impact on healthcare workers working through the pandemic has been widely reported in the literature, and a similar result was observed in the current study.[21–23] Majority of the participants reported a high stress level while at work due to the fear of acquiring the disease and also spreading it to their family members. Financial insecurity was reported as the third most common cause of anxiety among ophthalmologists. Hence, there is a need for introducing measures like mental health wellness programs in association with psychologists and psychiatrists and non-academic virtual meetings of peers. This will help them understand that everyone is going through the same phase and high-stress levels will only worsen the physical and mental well-being of the individual.

Conclusion

To conclude, the results of the current study suggest that the COVID-19 pandemic has dramatically changed the ophthalmic practice in India. Telemedicine has gained prominence among ophthalmologists during the pandemic. High-stress levels have been reported by practicing ophthalmologists. AIOS guidelines have been reported useful by the majority of ophthalmologists.

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Conflicts of interest

There are no conflicts of interest.

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