

Impact of COVID-19-related lockdown-I on a network of rural eye centres in Southern India

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Purpose: With the outbreak of coronavirus disease 2019 (COVID-19), India went for lockdown-I on March 23, 2020. In this article, we report on the demographic profile and ocular disorders from our 20 rural eye centres during lockdown-I and its comparison with the pre-lockdown period. **Methods:** A retrospective analysis was conducted for all patients who visited or had teleconsultations at the 20 rural centres in our network between March 23 and April 19, 2020. Demographic and clinical details were collected from electronic medical records (EMR). Subspecialty was decided based on the diagnosis. Patients who needed advanced care were referred to the higher tertiary centres. We report the profile of patients seen and managed at the rural centres and the reasons for referrals. We also compare the data with the pre-lockdown period. **Results:** During the lockdown-I period, a total of 263 patients were treated including 48 teleconsultations (18.25%). The mean age was 48.16 years (SD: 19.53 years). There were 118 females (44.87%). As compared to pre-lockdown, during the lockdown, the patient visits were highest in the cornea and anterior segment specialty with 114 patients (43.35%), including conjunctivitis ($n = 25$; 22.32%). Of the 263 patients, 24 patients (9.12%) were referred to tertiary centres. This includes 6/27 (22.22%) patients of microbial keratitis. As compared to this, during pre-lockdown, 28,545 patients were seen. The mean age was 49.03 years (SD: 19.24 years). There were 14,927 (52.29%) females. The referral was 1525 (5.34%), including 34/249 (13.65%) of those with keratitis. **Conclusion:** Lockdown-I had significantly impacted patient care in rural areas. As compared to the pre-lockdown period, during the lockdown, there was an issue with access to services by females. Despite a higher number of specialty patients (including emergencies) visiting during the lockdown, 91% of the patients who visited rural centres could be managed locally, avoiding long-distance travel.

Key words: Coronavirus, lockdown, ophthalmology

The hospitals in Wuhan, Hubei province, China, reported on the first cluster of cases of pneumonia as a result of coronavirus disease 2019 (COVID-19) infection in December 2019.^[1] The World Health Organization (WHO) announced this as an outbreak of Public Health Emergency of International Concern (PHEIC) on January 30, 2020; and later declared it as a pandemic on March 11, 2020.^[2] To contain the spread of the disease, many countries have sealed their borders, suspended air travel, and imposed travel restrictions. The Ministry of Health and Family Welfare (MoHFW), India, issued a travel advisory that included self-quarantine for 14 days along with guidelines to contain the spread. India has announced the lockdown process with a "Janta Curfew" on March 22, followed by a nationwide lockdown. The hospitals across the country provided only emergency services and started to offer services through telemedicine. This situation is applied to eye hospitals, too.^[3] In response to this, the functions in the hospitals in our network were also limited to emergency services. We had

earlier reported on the demographics and clinical presentation of ocular disorders at our tertiary care hospitals during lockdown-I.^[3] However, there is little information on the demographic and clinical presentation of ocular disorders in rural areas during lockdown-I as well as its comparison with the pre-lockdown period. In this article, we report on the demographic profile and ocular disorders from our 20 rural eye centres during lockdown-I and its comparison with the pre-lockdown period.^[4]

Methods

A retrospective cross-sectional observational study was conducted for all patients who visited or had teleconsultations at the 20 rural centres in our network between March 23 and April 19, 2020. It was approved by the Institutional Review Board (IRB) of L V Prasad Eye Institute and adhered to tenants of the Helsinki declaration. A standard consent form for electronic data privacy was signed by the patient or the parents/guardians at the time of registration. Demographic and clinical details of the patients were recorded on the eyeSmart electronic medical records (EMR)

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system.^[5] Based on the diagnosis, the patients were divided into different subspecialties such as cornea and anterior segment, cataract, refractive, trauma, retina, oculoplastics, glaucoma, neuro-ophthalmology and pediatrics. Post-cataract surgery patients were included in the cataract group. The patients who needed advanced care and complex management were referred to the higher tertiary centres in the network.

All patients were examined using the standard protocol designed for COVID-19.^[6] In brief, all clinical staff donned the required personal protective equipment (PPE), that is, protective gowns, surgical caps, 3-ply masks, face shields, and protective glasses. The patients were instructed to wear masks and cover their nose and mouth, and this was strictly monitored. A triage questionnaire was administered to all patients at the entrance to obtain details on the history of fever, cough, difficulty in breathing, exposure to COVID-19 patients or their contacts, and any history of quarantine. A home-quarantine stamp was also checked on the dorsum of the hand. Over the past 2 weeks, a travel history to the COVID-19 outbreak area and history of attending any social event was ruled out. All those with a history of redness of eyes in the past 2 weeks were fast-tracked for a clinical examination to reduce the waiting time.

Precautions were taken for the safety of both patients and caregivers. Only essential procedures were performed. Vision assessment was restricted to checking visual acuity and refraction was not done during this period. Slit-lamp examination was done using a barrier attached to the slit lamp. Intraocular pressure measurements and fundus evaluation were done only when necessary. A record was kept of all referrals to tertiary centres. Patients with conjunctivitis were examined directly by the ophthalmologist in a designated room, without contact with any other clinical staff. Teleconsultation services were offered as described in our previous publication.^[7] Data on the lockdown-I period were compared with the pre-lockdown period.

Results

Table 1 shows the demographic profile of the patient seen during pre-lockdown (April 2019) versus lockdown-I. During the lockdown, a total of 263 patients were treated including 48 teleconsultations (18.25%). Among these, there were 71 new patients (27%) and 192 follow-ups (73%) who visited in person. The mean age was 48.16 years (SD: 19.53 years), the median age was 53 years, (interquartile range 36–54 years). Pediatric patients (less than or equal to 16 years of age) were 24 (9%); 20 (83.3%) were males and 4 (16.7%) were females. There were 145 males (55.13%) and 118 females (44.87%). Of the 263 patients, 171 (65.02%) were paying patients and 92 (34.98%) were non-paying patients. In terms of occupation, 117 (44.5%) were not working (including housewives), 81 (30.8%) were daily wage workers, 38 (14.4%) were retired staff or students, and 27 (10.3%) were in service.

Table 2 shows the subspecialty wise breakdown of the patients pre-lockdown and during lockdown-I. As compared to pre-lockdown, during lockdown-I, the patient visits were higher in the cornea and anterior segment specialty with 114 patients (43.35%), trauma (5.7%), retina (3.42%), and oculoplastic (3.04%). Those in cornea and anterior segment included microbial keratitis ($n = 27$; 24.11%), conjunctivitis ($n = 25$; 22.32%), pterygium ($n = 9$; 8.04%), uveitis ($n = 9$; 8.04%), allergic conjunctivitis ($n = 8$; 7.14%) and others (subconjunctival hemorrhage, episcleritis, adherent leucoma, corneal abrasion, corneal foreign body) ($n = 34$; 30.36%). None of the patients with conjunctivitis had any other symptoms (fever, cough, etc.).

Table 1: Demographic profile of the patient seen during pre-lockdown versus lockdown-I period

	Pre-lockdown (%)	Lockdown-I (%)
Total patient seen	28545	263
Mean age	49.03 (19.2)	48.16 (19.53)
Females	14927 (52.29)	118 (44.9)
Children	2457 (8.61)	24 (9)
Teleconsultation	0	48 (18.25)
Referral	1525 (5.34)	24 (9.12)

Of the 263 patients, 24 patients (9.12%) were referred to tertiary centres. These included 14 (58.33%) new patients and 10 (41.67%) follow up patients. The diagnosis of these patients is shown in Table 3. All the referred patients were discussed with the subspecialists at tertiary centres before referrals. One patient of microbial keratitis underwent tissue adhesive with a bandage contact lens application for descemetocoele at a rural centre.

Discussion

Lockdown-I severely impacted patient footfalls in rural centres. In the pre-lockdown period, we saw on an average 1100–1200 patients on a daily basis. During lockdown-I, we could serve only 263 patients. Unlike pre-lockdown, where we had more female patients (52.3%), during lockdown we had more male patients (55.13%). It's likely that due to lockdown, there would have been issues related to accessing services by female patients, thus reducing their footfalls.

Unlike pre-lockdown, during the lockdown, the majority of these patients were treated in cornea services (42.59%), including those with conjunctivitis. Nearly 27 (24.11%) had microbial keratitis and most of them were managed at the local level. Six of these patients (22.22%) needed a referral to higher centres, unlike pre-lockdown where 34/349 (13.7%) were referred. The chronicity of keratitis would likely be different during this time period, thus explaining the difference in referral rates.

Cataract was the next common condition treated during this period (39.92%). With lockdown being declared at a very short notice, 97 (92%) operated patients still had to visit the centres for postoperative follow-up care.

Twenty-three patients in this study had conjunctivitis and were prescribed antibiotic eye drops. Conjunctivitis has been reported in positive cases of COVID-19 with pneumonia.^[8] However, we have not tested any of the patients with conjunctivitis for COVID-19 positivity. None of these patients had other symptoms or any serious illness when enquiries were made over phone calls.

Overall, nearly 91% of the cases were managed at the rural centres and 9% needed a referral to higher centres, however, pre-lockdown the referral rate was 5.34%.^[9] This was due to a higher number of specialty patients (including emergencies like microbial keratitis, trauma, retina cases) visiting during the lockdown, thus, increasing the referral rates. Some of these had to be referred to because we could not do the required surgeries at the rural centres. Some patients worsened on treatment and needed advanced care. Patients having total cataracts were referred to tertiary centres for surgery as no cataract surgeries were done at rural centres during this period. This was to prevent the occurrence of lens-induced glaucoma which is higher in developing countries.^[10] However, the presence of rural centres

Table 2: Specialty wise distribution of patients during pre-lockdown and lockdown-I period

	Pre-lockdown n (%)	Lockdown-I n (%)	Lockdown-I Teleconsultations (%)
Cornea and anterior segment	6541 (22.91)	114 (43.35)	26 (9.89)
Cataract	14800 (51.85)	109 (41.44)	8 (3.04)
Refractive error	6541 (22.91)	0 (0)	0 (0)
Trauma	73 (0.26)	15 (5.7)	1 (0.38)
Retina	410 (1.44)	9 (3.42)	6 (2.28)
Oculoplastic	246 (0.86)	8 (3.04)	2 (0.76)
Glaucoma	578 (2.02)	6 (2.28)	4 (1.52)
Neuro-Ophthalmology	155 (0.54)	2 (0.76)	1 (0.38)
Strabismus	60 (0.21)	0 (0)	0 (0)
Grand total	28545 (100)	263 (100)	48 (18.25)

Table 3: Referrals to different subspecialties

Referral overview	n	%
Cornea and anterior segment	8	33.33%
Microbial keratitis	6	25.00%
Ocular myiasis	1	4.17%
Conjunctivitis	1	4.17%
Retina	6	25.00%
Acute endophthalmitis	2	8.33%
Rod cone dystrophy	1	4.17%
Tractional retinal detachment	1	4.17%
Choroidal neovascular membrane	1	4.17%
Retinal vasculitis	1	4.17%
Cataract	4	16.67%
Total cataract	4	16.67%
Trauma	2	8.33%
Retinal detachment	1	4.17%
Corneal ulcer	1	4.17%
Neuro-Ophthalmology	2	8.33%
Optic atrophy	1	4.17%
Congenital nystagmus	1	4.17%
Glaucoma	2	8.33%
Painful blind eye	1	4.17%
Lens-induced glaucoma	1	4.17%
Grand Total	24	100.00%

ensured care is provided at their doorstep, avoiding long travel for many of these patients during the lockdown.

Teleconsultations were fewer compared to in-person visits. In rural areas, patients have less exposure to online and virtual services, and they prefer visiting hospitals. It would be useful to encourage teleconsultations and take care of postoperative patients through teleconsultation in the future.^[7,11]

Conclusion

In conclusion, lockdown-I had significantly impacted patient care in rural areas. Despite a higher number of specialty patients (including emergencies) visiting during the lockdown, 91% of the patients who visited rural centres could be managed locally, avoiding long-distance travel. This includes 21/27 (77.78%) cases of microbial keratitis that were managed at the local level. As most of these patients are from the local community, we anticipate a significant increase in the footfalls at these centres, after the lockdown is lifted and the situation returns to normal.

As we move ahead, patient care needs to be modified and improved to include a combination of in-person visits as well as teleconsultations, to increase accessibility to care.

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Conflicts of interest

There are no conflicts of interest.

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