Clinical diversities of patient eye care in para-COVID-19 era in Western Odisha

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ABSTRACT

Background: Coronavirus disease (COVID-19) pandemic had an unprecedented effect on eye care services. The present study was conducted to assess the varied eye diseases and care around COVID-19 pandemic. Methods: This retrospective study was conducted at BBMCH, Balangir, Ophthalmology Department, Western Odisha, from September 2019 to May 2021 in three phases (i.e., September 2019 to March 2020, April to October 2020, November 2020 to March 2021). The total OPD consultations and emergency eye surgeries conducted around the COVID-19 period were retrieved from direct attendance in the OPD register, references, or tele-consultation.

Results: Cumulative OPD eye consultations were found to be 13000, 3700, 7200 in pre-COVID, COVID and post-COVID period, respectively. Marked decrease in OPD cases (70%) was noticed in peak COVID period (April 2020 to October 2020) followed by slight increase during November 2020 to May 2021 i.e., (40% decrease). Allergic conjunctivitis was the commonest presentation in pre-COVID era, as compared to refractive error in COVID period. In post-COVID period, referrals, follow up cases, pending old surgical cases, red eyes formed major chunk of OPD attendance. Only 30% emergency cases underwent surgery during peak COVID, (Trauma cases, lens induced glaucoma, hypermature cataract, MLC cases, and one-eyed patients). But during post-COVID period this rose to 60%. Eight pediatric patients with intracorneal foreign body were given urgent treatment.

Conclusion: Due to government guidelines and lockdown restrictions, majority (65%) of patients could not receive adequate treatment. But relaxation of rules in post-COVID period increased patient load to 75%.

Keywords: COVID-19 era, limited manpower, lockdown, PPE kit, teleconsultation, WHO

Introduction

COVID-19 pandemic was caused by a highly virulent and contagious virus, named severe acute respiratory syndrome coronavirus -2 (SARS-CoV-2) virus. The affected population presented with varied intensity of clinical features. But, seriously ill patients were of older age, immunocompromised with associated underlying chronic conditions like diabetes, chronic respiratory diseases. Though tertiary eye care facilities are readily available around us, still, due to lockdown guidelines and ignorance about this new deadly disease, many patients had more access to primary care treatment or follow-up. Official lockdown started from March 24, 2020 nationwide but Western Odisha had relaxations due to initially less disease burden. BBMCH, being a tertiary eye care hospital and covering a vast population (urban and rural) had challenging task, with regards to proper COVID eye care through limited resources and manpower. COVID posting of our staff, social distancing norms, restricted our ability to cater all the needy patients. OPD patients were made mandatory to have rapid antigen test before being examined. Some investigations and even surgeries were kept aside to abide Government rules. Many patients had delayed presentations to our OPD. Camp activities and mobile van eye treatment were restricted as per the prevailing Government Guidelines, thereby increasing the patient load on primary physicians. Referrals from primary care hospitals were subsequently increased to a larger extent to cater the increasing patient load.
need. Proper guidelines were declared by ministry of health and family welfare (MOHFW) and national programme for control of blindness (NPCB) to cover patients, without landing in transmission of infection to treating health workers. Even emergency ophthalmic cases were clearly defined to be taken with utmost urgency. Electronic media consultation[13] were encouraged after few months to decrease the prevalence or lessen the disease overload.

Materials and Methods

This retrospective study was conducted at BBMCH, Balangir (Ophthalmology department) which is a referral and reliable tertiary eye care hospital since last few years. It covered many urban and rural areas of Balangir district as well as areas of Chhattisgarh and other neighbouring districts of Western Odisha.

An informed consent was taken on strict basis, either from patients or accompanying attendants before being subjected to any procedure. Ethical committee approval was taken for this study. This study was performed with an aim to evaluate the impact and comparison of COVID-19 pandemic and lockdown rules on pre-COVID, COVID and post-COVID period, on patient eyecare (i.e., September 2019 to May 2021).

Data were collected from OPD registers, record books, DBCS documents within the stipulated study period.[13] MOHFW and NPCB protocols and guidelines were strictly followed by all our staff. More emphasis were given to sanitisation, social distancing, entry point screening and triaging of patients, use of PPE kits and gloves, postponement of non-emergency and referral eye cases, limited use of eye instruments with protection shields, masks and sanitizers.

Sample size

OPD attendance decreased by almost 96% in Sindhuja K et al. study.[13]

Keeping this value as reference, the minimum required sample size with 0.8% margin of error and 5% level of significance is 2028 patients. To decrease the margin of error in our study, the sample size taken was 3700 during peak COVID period, comprising 3.5 times in pre-COVID period (13,000)

Formula used: N> = (P (1-P) (ME/Zalpha) 2

Where Zalpha is value of Z at two-sided alpha error of 5%. ME is margin of error and P is percentage decline in number of patients.

Calculations: n> = (0.965 (1-0.965)/(0.008/1.96) 2 = 2028

Statistical analysis

Numbers and percentage (%) were used for categorical variables. Chi-square test was used to analyse qualitative variables. Fischer's exact test was used to cell value< = 5. Microsoft Excel spread sheet was used for data entry with final analysis by SPSS software. P value of less than 0.05 was taken as significant value.

Results

Cumulative OPD visits to our department during pre-COVID, COVID and post-COVID period were 13000, 3700, and 7200 patients, respectively, which accounted for 62, 8, and 35 patient visits/day, respectively. These varied figures reflected the reduction of OPD visits to around 70% and 40% in COVID and post-COVID period, respectively [Table 1]. Figure 1 shows less number of OPD visits by patients during COVID-19 period in comparison to para-COVID-19 period i.e., in mid- months of 2020.

17 patients of non-healing corneal ulcer, 12 patients of globe injury, 5 patients of panophthalmitis, and 4 hyphaema patients were treated on emergency basis due to COVID restrictions and mobility restrictions [Table 2]. Non-emergency eye cases visited in large proportions as compared to emergency eye cases and retina cases especially during pre and post COVID-19 period [Figure 2]. Table 3 shows that anterior segment diseases were more commonly involved as compared to posterior segment eye diseases. The number of cases were more in para-COVID-19 period as compared to COVID-19 period [Figure 3]

Sunetra eye camps, spectacle distribution activities, and cataract/glaucoma screening in Block and school levels were avoided. Due to lockdown rules, trauma cases increased to relative extent. Elective eye surgeries were postponed and not entertained during peak COVID period, with necessary advice and treatment. Emergency cases were attended in immediate post-COVID period, giving priority to complicated/urgent cases like lens induced glaucoma, hypermature cataract, one eyed patients, referral surgeries, etc.

Discussion

COVID-19 pandemic modulated eye health care services to a large extent with lockdown restrictions and social distancing norms.[13] Resources available were checked to an appreciable degree thereby, minimising the number of new patients attending OPD and increased the active participation of primary care physicians.[13] Real time polymerase chain reaction (RT-
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In our BBMCH OPD, attendance of emergency eye cases decreased to around 67% as compared to 84% of non-emergency eye cases in COVID peak period. Anterior segment eye cases decreased in visits by 71.6% during COVID time interval as compared with posterior segment eye cases by 76.2%, which resembled with many other such studies. Socioeconomic state residential status, gender, and age distribution data were not available due to limited human resources. Computer vision syndrome and asthenopia problems increased due to lockdown guidelines and more use of digital solutions in daily lives. Red eye cases, perhaps due to chemical reaction of sanitizers became the most concerned.

| Table 1: Comparison of pre-COVID, COVID, and post-COVID OPD visits (month wise) at BBMCH |
|-----------------------------------------------|---------------|---------------|---------------|
| Months | OPD visits n=13000 | Months | OPD visits n=3700 | Month | OPD visits | COVID decrease(%) | Post-COVID decrease (%) |
|---|---|---|---|---|---|---|---|
| Sept, 2019 | 2500 (19.2%) | Apr 2020 | 415 (11.2%) | Nov, 2020 | 795 (11%) | 83.4% (1st month) | 68.2% (1st month) |
| Oct 2019 | 1900 (14.6%) | May 2020 | 405 (11%) | Dec 2020 | 885 (12.3%) | 78.7% (2nd month) | 53.5% (2nd month) |
| Nov 2019 | 1800 (13.8%) | June 2020 | 485 (13.1%) | Jan, 2021 | 915 (13.1%) | 73% (3rd month) | 57.5% (3rd month) |
| Dec 2019 | 1700 (13%) | July 2020 | 480 (13%) | Feb 2021 | 995 (13.8%) | 71.8% (4th month) | 51.5% (4th month) |
| Jan 2020 | 1400 (11%) | Aug 2020 | 490 (13.2%) | Mar 2021 | 1100 (15.2%) | 65% (5th month) | 21.5% (5th month) |
| Feb 2020 | 1700 (13%) | Sep 2020 | 675 (18.2%) | Apr 2021 | 1200 (16.7%) | 60.3% (6th month) | 29.5% (6th month) |
| March 2020 | 2000 (15.4%) | Oct 2020 | 750 (20.3%) | May 2021 | 1280 (17.8%) | 62.5% (7th month) | 36% (7th month) |
| Total | 13000 | Total | 3700 | Total | 7200 |

| Table 2: Distribution and Comparison of presented eye diseases |
|-------------------|---------------|---------------|
| Emergency eye disease | Pre-COVID | COVID | Post-COVID | Percentage decreased |
| Allergic Conjunctivitis | 1260 | 380 | 970 | COVID | Post-COVID |
| Computer vision syndrome | 960 | 1140 | 1790 | -19 | -86.4 |
| Conjunctivitis | 910 | 230 | 530 | 63.8 | 41.8 |
| Red eye | 890 | 210 | 520 | 76.4 | 41.6 |
| Mature Cataract | 880 | 240 | 570 | 76.2 | 35.2 |
| Foreign body | 860 | 210 | 620 | 73.6 | 28 |
| Viral keratitis | 420 | 60 | 273 | 85.8 | 35 |
| Corneal ulcer | 94 | 17 | 46 | 81.9 | 51.1 |
| Uveitis | 78 | 15 | 36 | 80.8 | 53.9 |
| Anaphylaxis | 54 | 16 | 28 | 70.4 | 48.2 |
| External Hordeolum | 53 | 17 | 31 | 68 | 41.6 |
| Infected chalazion | 51 | 19 | 30 | 66.8 | 41.2 |
| Lens induced glaucoma | 50 | 17 | 24 | 66 | 52 |
| Dacryocystitis | 42 | 14 | 23 | 66.7 | 45.3 |
| Glove Injury | 38 | 12 | 20 | 68.5 | 47.4 |
| Paediatric cataract | 24 | 10 | 12 | 58.4 | 50 |
| Endophthalmitis | 21 | 5 | 10 | 76.2 | 52.4 |
| Hyphaema | 15 | 4 | 9 | 73.3 | 40 |

| Non-emergency cases |
|-------------------|---------------|---------------|
| Asthenopia | 205 | 445 | 640 | 78.3 | 68.8 |
| Refractive error | 3685 | 490 | 870 | 86.7 | 76.4 |
| Postoperative cataract surgery | 245 | 32 | 62 | 87 | 74.7 |
| Immature cataract | 190 | 25 | 45 | 86.9 | 76.3 |
| Pterygium | 56 | 10 | 15 | 82.2 | 73.2 |
| Glaucoma | 38 | 6 | 12 | 84.2 | 68.4 |
| Xerophthalmia | 36 | 3 | 7 | 81.3 | 57 |
| Chalazion | 20 | 3 | 7 | 81.3 | 65 |

| Table 3: Distribution of anterior segment and posterior segment eye diseases |
|-------------------|---------------|---------------|
| Type | Pre-COVID | COVID | Post-COVID |
|----------------|-----------|-----|-----|
| Anterior Segment | 12989 | 3695 | 7190 |
| Posterior Segment | 10 | 5 | 10 |

PCR) testing was not readily available and rapid antigen test and trauma tests were encouraged. Only emergency cases were given priority deferring the referrals and non-emergency conditions. OPD attendance of patients and elective surgeries were reduced to significant level thereby hampering the expected outcome of our Sunetra government scheme and goals. In post-COVID period, tele consultation revived the decreased shift. In our BBMCH OPD, attendance of emergency eye cases decreased to around 67% as compared to 84% of non-emergency eye cases in covid peak period. Anterior segment eye cases decreased in visits by 71.6% during COVID time interval as compared with posterior segment eye cases by 76.2%, which resembled with many other such studies. Socioeconomic state residential status, gender, and age distribution data were not available due to limited human resources. Computer vision syndrome and asthenopia problems increased due to lockdown guidelines and more use of digital solutions in daily lives. Red eye cases, perhaps due to chemical reaction of sanitizers became the most concerned.
problem during peak COVID.\textsuperscript{[12,14]} Cataract surgeries done during peak covid period, were only for lens induced glaucoma and hypermature cataract and comprised only 12% as compared to pre COVID period. Only 120 minor eye surgeries were done during COVID time which included 85 cases of foreign body removal, 30 cases were incision and curetted for chalazion, 2 epilation cases for trichiasis, and excision of small pterygium in 3 patients. In post-COVID period, visits increased relatively, so also the treatment available to them. Being a referral eye hospital and merge of medical college with district headquarter hospital, this nodal centre covered all primary care institutions of Western Odisha, thus reflecting the exact proportional data of comprehensive eye care in the society. This varied clinical data will support the primary care physicians to take timely decision for triage referral in subsequent wave of COVID-19.\textsuperscript{[15,16]}

**Conclusion**

Lack of internet facilities and less adequate transport facilities hindered the eye care to significant level, for patients in rural areas. This pandemic has affected the income sources and psychological behaviour of many persons thereby continuing lives with fear and restricted style. Chronic awareness, job alternatives, new scheme, and help are implemented by both state and central government to improve the human resources, facilities at all different eye care levels. Fund raiser organisations, voluntary workers have joined hands with available government health staff and authorities to bring back the services back to normal (pre-COVID era).

**Summary**

This retrospective study reveals the snapshot of varied clinical eye presentations in para-COVID-19 era, in Western Odisha. It was conducted to evaluate the impact and comparison of COVID-19 pandemic and lockdown rules on pre-COVID, COVID, and post-COVID period, on patient eyecare (i.e., September 2019 to May 2021). Allergic conjunctivitis was the commonest presentation in pre-covid era, as compared to refractive error in covid period. In post-COVID period, referrals, follow-up cases, pending old surgical cases, red eyes formed bulk of OPD attendance. Only 30% emergency cases underwent surgery during peak COVID, (Trauma cases, lens induced glaucoma, hypermature cataract, MLC cases, and one-eyed patients), compared to 60% in post-COVID period.

**Key take home message**

Adequate knowledge about diverse clinical eye presentations in para-COVID-19 era and active intervention at all eye care set ups will reduce the prevalence of severe COVID-19 eye sequelae. Prompt decision-making and timely triage by the primary care physicians are the key strategies to achieve better eye care.

**Novelty of the study**

This study provides insight into the prevailing eye conditions during para-COVID-19 era of the Western Odisha, reflecting the population having low socioeconomic status, social taboos, and transport hindrances. There are limited published data on the clinical diversities of patient eye care in para-COVID-19 era and this study is first of its kind adding knowledge to the existing data.

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**Conflicts of interest**

There are no conflicts of interest.

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