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Influence of COVID-19 pandemic on the cataract services in a district hospital

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Abstract

Purpose: In March 2020, COVID-19 was declared a pandemic by the World Health Organization. The COVID-19 pandemic significantly disrupted the healthcare system, including the number of elective ophthalmic procedures conducted worldwide, resulting in a large-scale deferment of cataract surgeries after the Malaysian government recommended to postpone all nonessential elective surgeries to minimise the virus transmission and to augment the hospital resources to cope with a surge in COVID-19 cases. This study assessed the influence and impact of the COVID-19 pandemic on the cataract services in a district hospital.
Study design: Retrospective descriptive analysis.
Methods: This study analysed cataract surgery services in the period between January 1, 2017 and 31 December 31, 2021. Data were extracted from the electronic medical records. The study population was further divided into 3 groups according to the COVID-19 pandemic status: pre-pandemic, lockdown and recovery phase.
Results: A total of 8,125 eyes were included in this study. During the lockdown phase, there was a 42% decline in the number of surgeries done compared to the pre-COVID-19 phase. A higher number of patients (53.5%) presented with severe visual impairment or blindness during the lockdown phase as compared to 40.2% during the pre-COVID-19 phase. The number of lens-related complications was markedly higher (2.58%) during the lockdown phase, as compared to the pre-COVID-19 phase (0.64%). During the end of the recovery phase studied, there was an early increment in the number of surgeries done, surpassing that of the pre-COVID-19 phases.

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Conclusion: The COVID-19 pandemic caused a drastic reduction in the number of cataract surgeries performed during the lockdown phase, causing more patient to suffer from avoidable blindness due to cataract, and leading to a higher rate of lens-related complications. An intuitive approach and reorganisation of ophthalmic care services are essential in order to lessen the backlog without causing burnout among healthcare workers.

Keywords: cataract, COVID-19 pandemic, preventable visual impairment

Kesan pandemic COVID-19 ke atas perkhidmatan katarak di hospital daerah

Abstrak

Tujuan: Pada Mac 2020, Pertubuhan Kesihatan Sedunia telah mengistiharkan COVID-19 sebagai pandemik. Berikutan dengan pengumuman tersebut telah berlaku gangguan ke atas perkhidmatan kesihatan di serata pelusuk dunia. Kerajaan Malaysia juga mengambil tindakan menyarankan penangguhan pembedahan kes yang dikira tidak mempunyai keperluan mendesak dan mengembeling tenaga serta sumber untuk mengurangkan penyebaran virus tersebut dan peningkatan jangkitan. Ini seterusnya menyebabkan penangguhan pembedahan katarak bersekala besar. Kajian ini bertujuan mengenalpasti kesan dan impak pandemik COVID-19 ke atas perkhidmatan katarak di salah satu hospital daerah di Malaysia.
Bentuk kajian: Kajian deskriptif retrospektif.
Kaedah kajian: Kajian ini menganalisakan pembedahan katarak di antara 1 Januari 2017 sehingga 31 Disember 2021. Data di ambil dari rekod perubatan elektronik. Analisa dibahagikan kepada 3 bahagian mengikut status pandemik COVID-19: sebelum pandemik, kawalan pengerakan dan fasa pemulihan.
Keputusan kajian: Sebanyak 8,125 mata terlibat dalam kajian. Semasa tempoh pandemik dimana kawalan pergerakan dijalankan didapati terdapat penurunan sebanyak 42% penurunan pembedahan katarak berbanding sebelum pandemik. Didapati lebih tinggi bilangan pesakit katarak mendapat pengurangan ketajaman penglihatan yang teruk dan kebutaan (53.5%) semasa pandemic berbanding dengan sebelum pandemik (40.2%). Kadar komplikasi akibat katarak adalah lebih tinggi (2.58%) semasa fasa kawalan pengerakan berbanding dengan sebelum pandemic (0.64%). Pada fasa awal pemulihan, peningkatan kadar pembedahan katarak mula berlaku dan melebihi kadar sebelum pandemik.
Kesimpulan: Pandemik COVID-19 menyebabkan penurunan drastik pembedahan katarak semasa kawalan pergerakan dan peningkatan kadar kebutaan yang boleh

dielakkan serta komplikasi akibat katarak. Langkah yang intuitif dan penyusunan semula perkhidmatan oftalmik penting untuk mengurangkan 'back-log' tanpa menyebabkan 'burn-out' dikalangan pekerja kesihatan.

Kata kunci: COVID-19, katarak, penurunan ketajaman penglihatan yang boleh dielakkan

Introduction

The World Health Organization (WHO) considers cataract the first leading cause of preventable visual impairment worldwide.[1] WHO declared COVID-19 an international public health concern on January 30, 2020,[2] and a pandemic on March 11, 2020.[3] The COVID-19 pandemic significantly disrupted the healthcare system, including the number of elective ophthalmic procedures conducted worldwide,[4,5] resulting in a large-scale deferment of cataract surgeries after the Malaysian government recommended to postpone all the nonessential elective surgery to minimize the virus transmission and to augment the hospital resources to cope with a surge in COVID-19 cases.

Hospital Taiping is the second largest hospital in Perak and an important referral centre for other district hospitals in northern Perak. The objective of this study was to assess the influence and impact of the COVID-19 pandemic on cataract services in a Taiping district hospital.

Methods

This is a single-centre, retrospective descriptive analysis on cataract surgery services in the Department of Ophthalmology, Hospital Taiping, Perak, Malaysia. The data were extracted from the electronic medical record database (National Eye Database) for the period between January 1, 2017 and December 31, 2021 and recorded in a single Excel sheet (Microsoft Excel). All elective cataract surgeries performed during the period mentioned were included in this study without any exclusions. Data used for analysis included patient demographics data (gender and race), daycare or admission surgery, presenting visual acuity, laterality of eyes operated, lens-related complications, and type of cataract surgery. Descriptive statistics were analysed with Microsoft Excel 2019.

The study population was further divided into 3 groups according to the COVID-19 pandemic phase:

1. Pre-COVID-19 phase, from January 2017 to February 2020.
2. Lockdown phase under the Movement Control Order, from March 2020 to May 2021.

3. Recovery phase under the National Recovery Plan, from June 2021 to December 2021.

Results

The characteristics and clinical data of the study population are shown in Table 1. The proportion of intracapsular cataract extraction (ICCE) performed was much higher in 2020 (0.80%) and 2021 (0.71%) compared to 2017 to 2019.

Overall trend of cataract surgery

Overall, 8,125 eyes were included in this study. The monthly average number of cataract surgeries performed during the pre-COVID-19 phase was 157 eyes, which decreased to 90 eyes per month during the lockdown phase, with a 42% decline in the number of surgeries performed. During the recovery phase, we started to increase the surgical volume and an average of 112 cataract surgeries were performed per month (Fig. 1). There was a steep decline in the number of surgeries done since April 2020 (Fig. 2) after the implementation of the lockdown phase. In November and December 2021(recovery phase), there was an early steep increment in the number of surgeries performed, surpassing that of the pre-COVID-19 phases.

Presenting visual acuity

A higher proportion of patients (53.5%) presented with severe visual impairment or blindness during the lockdown phase as compared to 40.2% during the pre-COVID-19 phase. During the recovery phase, this proportion showed improvement, with the percentage of severe visual impairment or blindness decreasing to 44.9%, as shown in Table 2.

Lens-related complications

The proportion of lens-related complications was markedly higher (2.58%) during the lockdown phase as compared to the pre-COVID-19 phase (0.64%). This proportion decreased to 1.66% during the recovery phase. Figure 3 summarises the percentage of phacomorphic and phacolytic cases. The chart clearly shows the steep increase in the percentage of lens-related complications in 2020 and 2021.

Table 1. Characteristics of the study population who underwent cataract surgery in 2017–2021

Variable	Year				
	2017, *n* (%)	**2018, *n* (%)**	**2019, *n* (%)**	**2020, *n* (%)**	**2021, *n* (%)**
Gender					
Male	790 (44.8)	806 (43.3)	887 (44.8)	579 (46.2)	576 (45.6)
Female	975 (55.2)	1057 (56.7)	1094 (55.2)	673 (53.8)	688 (54.4)
Race					
Malay	940 (53.2)	993 (53.3)	1047 (52.9)	753 (60.2)	753 (59.6)
Chinese	527 (29.9)	548 (29.4)	586 (29.6)	281 (22.4)	287 (22.7)
Indian	295 (16.7)	317 (17.0)	337 (17.0)	215 (17.2)	217 (17.2)
Other	3 (0.2)	5 (0.3)	11 (0.56)	3 (0.2)	6 (0.5)
Laterality					
Right eye	947 (53.7)	942 (50.6)	1008 (50.9)	626 (50)	629 (49.8)
Left eye	818 (46.3)	921 (49.4)	973 (49.1)	626 (50)	635 (50.2)
Type of surgery					
Phacoemulsification	1562 (88.50)	1695 (90.98)	1780 (89.86)	1130 (90.25)	1178 (93.2)
ECCE	199 (11.27)	154 (8.27)	190 (9.59)	105 (8.39)	67 (5.30)
ICCE	3 (0.17)	4 (0.21)	7 (0.35)	10 (0.80)	9 (0.71)
Lens aspiration	1 (0.06)	10 (0.54)	4 (0.20)	7 (0.56)	10 (0.79)
Type of anaesthesia					
Local	1534 (86.9)	1572 (84.4)	1605 (81.0)	977 (78.0)	977 (77.3)
General	231 (13.1)	291 (15.6)	376 (19.0)	275 (22.0)	287 (22.7)
Type of admission					
Daycare	1176 (66.6)	1209 (64.9)	1213 (61.2)	767 (61.3)	766 (60.6)
Not daycare	589 (33.4)	654 (35.1)	768 (38.8)	485 (38.7)	498 (39.4)
Total	1765	1863	1981	1252	1264

n: Number; ECCE: Extracapsular cataract extraction; ICCE: Intracapsular cataract extraction

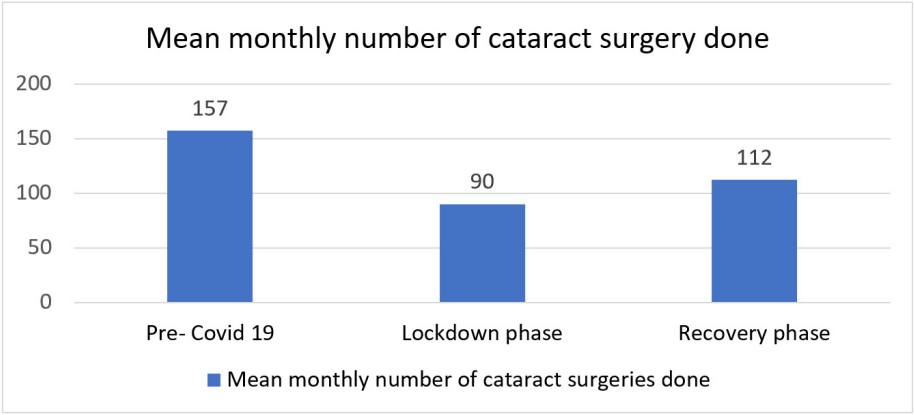

Fig. 1. Mean monthly number of cataract surgeries performed during the analysed periods.

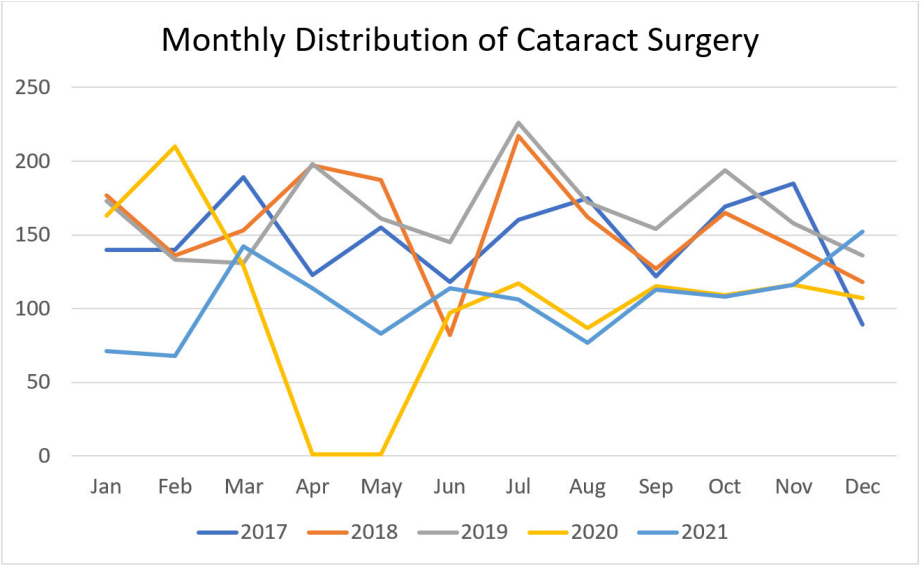

Fig. 2. Overall monthly trend of patients who underwent cataract surgery.

Table 2. Clinical characteristics of patients who underwent cataract surgery during the study period

Clinical characteristics	**Pre-Covid-19, *n* (%)**	**Lockdown phase, *n* (%)**	**Recovery phase, *n* (%)**
Number of surgeries	5982	1357	786
Mean monthly number of surgeries	157	90	112
Grade of uncorrected presenting visual acuity (all operated eyes)			
Mild impairment (6/18 and better)	1538 (25.8)	224 (16.5)	131 (16.6)
Moderate impairment (> 6/18 to < 6/60)	2031 (34.0)	408 (30.1)	302 (38.4)
Severe impairment (6/60 to 3/60)	390 (6.5)	85 (6.3)	51 (6.5)
Blind (< 3/60)	2008 (33.7)	640 (47.2)	302 (38.4)
Grade of uncorrected presenting visual acuity (eyes without ocular comorbidity)			
Mild impairment (6/18 and better)	1284 (27.0)	153 (16.5)	94 (18.2)
Moderate impairment (> 6/18 to < 6/60)	1603 (33.8)	284 (30.5)	185 (35.9)
Severe impairment (6/60 to 3/60)	284 (6.0)	49 (5.3)	33 (6.4)
Blind (< 3/60)	1578 (33.2)	444 (47.7)	203 (39.4)
Lens-related complications (total)	38 (0.64)	35 (2.58)	13 (1.66)
Phacomorhic glaucoma	12 (0.20)	11 (0.81)	4 (0.51)
Phacolytic glaucoma	7 (0.11)	8 (0.59)	4 (0.51)
Subluxated/Dislocated cataract	19 (0.32)	16 (1.18)	5 (0.64)
Intraoperative complications			
No	5860 (98.0)	1307 (96.3)	761 (96.8)
Yes	122 (2.0)	50 (3.7)	25 (3.2)

n: Number

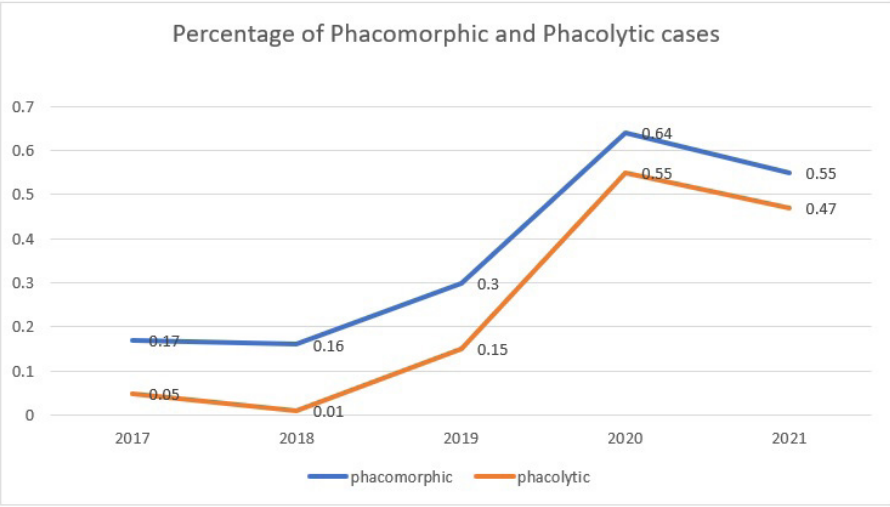

Fig. 3. Overview of percentage of phacomorphic and phacolytic cases in 5 years.

Discussion

This study quantifies the true impact and influence of the COVID-19 pandemic, whereby the volume of cataract surgeries decreased significantly during the lockdown phase and slowly recovered from November 2020, increasing steeply and surpassing the monthly average by November 2021.

The pandemic resulted in several cataract surgical centres around the world to close or significantly reduce the number of surgeries performed, thus increasing the number of patients suffering from avoidable blindness due to cataract.[5] This is an alarming finding, as visual impairment caused by cataract increases morbidity by increasing the risk of fall or trauma, affecting the ability for self-care and driving skill, and increasing the risk of depression.[5,6] Compared with a study from Poland[5] that showed a 53.4% reduction in cataract surgery performed during the pandemic, the mean monthly number of cataract surgeries performed in this study decreased by 42% during the lockdown phase. The legally mandated restriction of movement, the government recommendation to postpone all non-essential elective surgery to minimise virus transmission, lack of operating theatre staff due to deployment to COVID-19 wards, patient reluctance to visit the hospital and their desire to minimise risk of non-essential exposure to COVID-19, as well as transportation issue were all the contributing factors in the decreasing number of surgeries performed.

In our study, presenting visual acuity was worse during the lockdown phase. This could be due to prolonged duration of lockdown causing a reduction in the number

of cataract surgeries and an increase in the number of patients with advanced cataract; Das *et al.* had similar findings.6 Advanced cataract raised concerns from the both patients' and surgeons' perspectives.[5] This is evidenced in our study by the higher rate of lens-related complications during the lockdown phase compared to the pre-COVID-19 phase, which likely led to more difficult surgeries, which is evidenced in turn by the higher rates of ICCE performed in 2020 and 2021, higher rates of intraoperative complications, and possibly suboptimized visual outcome.

The backlog had been rapidly accumulating in view of the temporary closure of elective surgeries during the lockdown phase. A survey showed that 70% of patients were willing to undergo cataract surgeries with appropriate safety measures during the pandemic to improve their visual quality and quality of life.[7] During the recovery phase, we first needed to return to the original numbers or pre-COVID-19 phase, in terms of months, and later to focus on clearing the backlog, in terms of years.[8] In order to increase the surgical rate, proactive planning and efficiency are required. This can be achieved by increasing the working hours of surgeons in the operation theatre, using weekends and late evenings, and optimising unused operation theatres to increase the number of surgeries performed, provided there is an adequate number of staff. Senior and experienced surgeons should perform a maximum number of cases to decrease the duration of surgery per patient and to reduce the risk of complications.[4] Immediate sequential bilateral cataract surgery is another useful strategy to reduce exposure to COVID-19, the number of patient visits, and the recurring cost.[4,5] Reducing the time spent by patients in hospital can be done by encouraging daycare surgery.[5] All the strategies mentioned above were employed in this study in order to clear up the backlog.

There was a surge in the number of cataract surgeries performed in our centre during the recovery phase, surpassing the pre-COVID-19 phase in November and December 2021, showing that the effort to clear the backlog cases was in progress. Priority-based surgical care was rationalised based on visual acuity and cataract morphology. Government efforts to subsidise the cost of intraocular lenses to the B40 group should be praised.

The limitations of this study were manifold. First the study design corresponds to an audit and not a case analysis, so we were unable to verify whether the demographic and clinical characteristic of patients influenced their decision to undergo cataract surgery during the pandemic. The reliability of the data also depended on the accuracy of data entry. Finally, the postoperative visual outcome and surgical complications were not studied.

Conclusion

The COVID-19 pandemic caused a drastic reduction in the number of cataract surgeries performed during the lockdown phase, causing more patients to suffer from avoidable blindness due to cataract and leading to higher rates of lens-related complications. A buildup of cataract cases was unavoidable even in the recovery phase due to the backlog and addition of new cases. An intuitive approach and reorganisation of ophthalmic care services is needed to lessen the backlog without causing healthcare worker burnout.

Declarations

Ethics approval and consent to participate
None to declare, as this was a retrospective descriptive analysis.

Competing interests
None to declare.

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None to declare.

Acknowledgements
None to declare.

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