ORIGINAL ARTICLE

Effects of Prolonged Waiting Time on Visual Outcomes of Patients with Pediatric Cataract in a Tertiary Public Hospital

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ABSTRACT

Background. Pediatric cataract is one of the most common preventable cause of childhood blindness worldwide. Early and timely intervention of pediatric cataract is important to maximize the visual outcomes and start prompt visual rehabilitation.

Objectives. This study aimed to determine the average time from the day of initial consult at the outpatient clinic to the day of the cataract surgery and compare the effects of delayed surgery on visual outcomes of patients.

Methods. This is a retrospective chart review of medical records from January 2015 to June 2022. The dates of the different steps in the process up to the day of intervention were noted and the average interval duration and the total waiting time were determined. Patients operated on within 2 weeks from initial consult was defined as no delay while those operated >2 weeks had delayed surgery. Pre-operative and post-operative best corrected log MAR visual acuity were compared within each group to determine if delay in surgical intervention has a significant effect on the visual outcomes of patients.

Results. Median age at initial consult was 4.9 years while median age at surgery was 5.2 years. Ninety-nine (99) patients had developmental cataract and 123 patients had bilateral cataract. Leukocoria was the most common chief complaint (63.45%). Pre-operatively, 94 patients had strabismus, 49 had eye preference, 48 had nystagmus, and 43 had amblyopia in the diagnosis. There was significantly faster admission to cataract surgery during the pandemic compared to pre-pandemic period but there was no difference in the total waiting time. Patients with congenital cataract had the least total waiting time followed by developmental, and rubella cataract. There is no significant difference in visual outcomes between patients operated without delay and with delay.

Conclusion. There is delayed age at diagnosis and surgery of pediatric cataract patients in the Philippine General Hospital. Early surgery did not reflect better visual outcomes compared to delayed surgery probably due to delay in consultation of patients.

Keywords: pediatric cataract, congenital cataract, developmental cataract, prolonged waiting time, delayed surgery, visual outcomes

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INTRODUCTION

Pediatric cataract is one of the most common causes of preventable blindness in children worldwide. It is estimated that 200,000 children worldwide become blind due to cataract.[1,2] The overall global prevalence of childhood cataract was 0.32 to 22.9 per 10,000 children (median=1.03). Its incidence ranged from 1.8 to 3.6 per 10,000 children per year.[2]

Pediatric cataract can be unilateral or bilateral. It can either be congenital if it presents within the first year of life, developmental if it presents after the first year, or in rare cases it can also be due to metabolic, traumatic, inflammatory or infectious causes.[1] In a review of childhood cataract cases in a tertiary hospital in the Philippines, 61% of cases were idiopathic, while rubella infection and familial causes accounted for 20.5% and 1.4% of index cases, respectively.[3] Early recognition, delivering timely surgical intervention, and adequate visual rehabilitation are paramount to avoid irreversible visual damage secondary to visual deprivation amblyopia.[4]

Pediatric cataract blindness presents an enormous problem to developing countries in terms of human morbidity, economic loss, and social burden.[4] It has been recognized by the World Health Organization (WHO) as a priority to avoid blindness in children due to cataract, as emphasized and advocated by the Vision 2020: The Right to Sight Initiative.[2,4]

The goal of pediatric cataract surgery is to perform surgery at an age when the visual outcome is optimized while simultaneously minimizing the risk of glaucoma. Most pediatric ophthalmologists believe that the optimal time to operate on a congenital cataract is between 4 to 8 weeks of age.[5] Birch et al.[6] reported that unilateral congenital cataract had progressively worse visual outcome if operated beyond six weeks. In the Infant Aphakia Treatment Study (IATS), they found that the median visual acuity (VA) was significantly better for infants who underwent cataract surgery at three months of age or younger.[7] For bilateral congenital cataract, they noted that children who had cataract surgery delayed or later developed nystagmus were more likely to have a visual outcome of 20/100 or worse.[8] Visual rehabilitation and amblyopia management after cataract surgery is also important in improving long term visual outcomes.

The acceptability, accessibility, and affordability of cataract surgical services must each be carefully addressed to improve efficiency. Currently, there are no studies that assess the waiting time of patients from initial consultation to the time of cataract surgery. This information is crucial in improving the efficiency of services and providing timely surgical intervention to our patients.

This research aimed to determine the total time from initial consultation for pediatric cataract to the day the patient finally undergoes cataract surgery and its effect on visual outcome. The process is divided into different steps and the duration of each step were also measured. The results of this study can be used to improve health operations by decreasing the waiting time of patients, thereby providing early cataract surgery and earlier visual rehabilitation to improve long term visual outcomes of our patient and eventually decrease the burden of disability caused by childhood cataracts.

The Philippine General Hospital (PGH) is the Philippines' national university hospital whose mission is to render cost-effective, compassionate, and accessible health care. It also aims to provide world class education and undertake health system researches which can serve as basis for relevant health policies.

As a tertiary referral center, the Department of Ophthalmology and Visual Sciences of the Philippine General Hospital (PGH DOVS) receives pediatric cataract patients from different areas of the country. Before the COVID-19 pandemic, the patient first consults at the General Clinic (GC), the DOVS outpatient department, wherein all initial consults are seen by the Ophthalmologist-On-Duty (OOD). The OOD examines the patient and based on clinical findings will then refer the patient to the Pediatric Ophthalmology and Strabismus (POS) clinic. In the POS clinic, the residents and fellow will examine the patient then subsequently refer the patient to the consultant for surgical planning. Once they finalized the management, the patient will be referred to the anesthesiologist for pre-operative clearance on an out-patient basis. Once the patient has been cleared by the anesthesiologist, the patient can then be admitted and scheduled for cataract surgery.

After the start of the COVID-19 pandemic in March 2020, there have been changes in the process. The most significant change brought about by the pandemic was the introduction of telemedicine prior to a face-to-face consult at the General Clinic. It is essential to include the pandemic process in this study because these processes will continue as we transition to the new normal.

This study is essential in determining the delays in the process of providing early surgical intervention to our patients with pediatric cataract. To determine the impact of the delay in surgical intervention, we will compare the visual outcomes of patients with delay and without delay in cataract surgery. We need this information to come up with evidence-based approaches in decreasing waiting times, thereby improving efficiency of our services.

This study aimed to determine the average time it takes for pediatric cataract patients from the day of initial consult at the General Clinic/Telemedicine to the day of the cataract surgery and compare the effects of delayed surgery on visual outcomes of patients. Specifically, it aimed to describe the demographics and characteristics of patients with pediatric cataract undergoing initial intervention in a public tertiary hospital, determine the time interval between each step and the total waiting time for surgery, and determine the effects of delay in cataract surgery on visual outcomes of pediatric cataract patients.

METHODS

This is a retrospective chart review of medical records in the Sentro Oftalmologico Jose Rizal (SOJR), PGH DOVS. Ethics review board approval was obtained from the University of the Philippines Manila Research Ethics Board (UPMREB).

Medical records of pediatric cataract patients from January 2015 to June 2022 were retrieved for review. Pediatric charity patients who were referred to the POS clinic and subsequently underwent cataract surgery at the PGH DOVS were included in the study. Patients who underwent cataract surgery in other institutions and who had visually insignificant cataract on initial consult were excluded. Other exclusion criteria are presence of other concomitant ocular pathologies such as persistent fetal vasculature, uveitis, glaucoma, endophthalmitis, trauma (corneal perforating injury or sclerocorneal perforating injury), retinal detachment, metabolic, syndromic (including Down syndrome) and other systemic diseases (including cerebral palsy), presence of other surgical procedures done (glaucoma surgery, retinal detachment surgery, etc.) during initial surgery and having lost and incomplete charts.

Of the 319 charts retrieved, 197 patients were included in the study. One hundred fifty-eight (158) were from the pre-pandemic while 39 were from the pandemic period. The dates of the different steps in the process up to the day of intervention were noted (Figures 1 and 2). The average interval duration and the total waiting time were determined. Total waiting time was defined as the number of days from the general clinic consult to the day of the surgery. From the pre-pandemic period, 52 charts did not have dates of general clinic consult. For this cohort, the total waiting time was defined as the time from the POS clinic consult to the day of the surgery. For the pandemic period, twenty-eight patients entered the system through telemedicine. Of these, six patients were referred to GC first while 22 patients were referred directly to POS clinic. Nine (9) patients first consulted through GC while two patients were triaged straight to POS clinic without any GC or telemedicine consult.

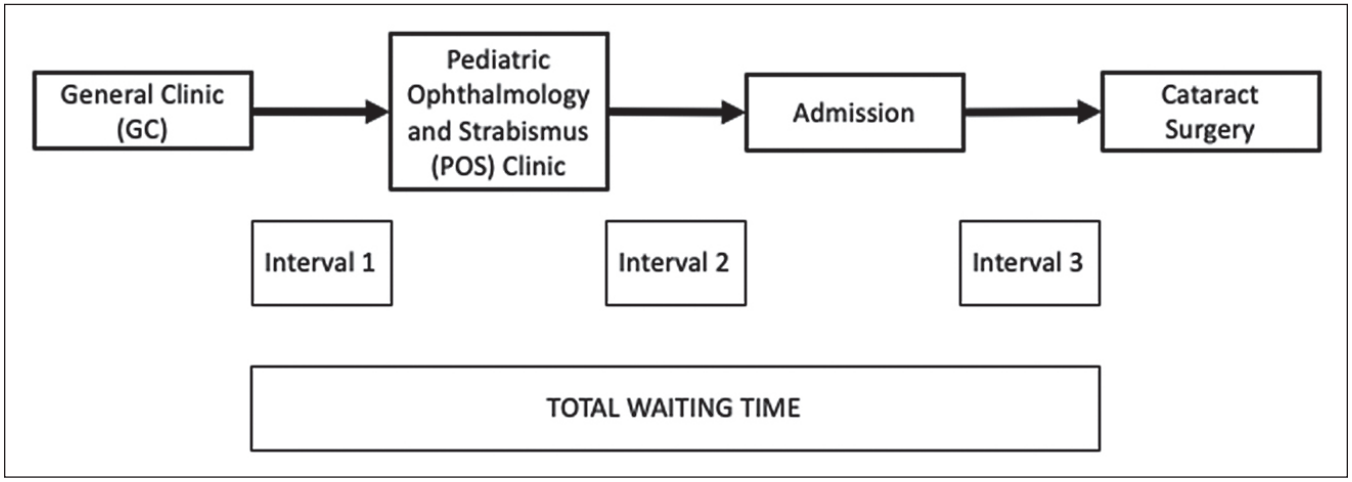

Figure 1. Visual representation of the steps in the pre-pandemic process.

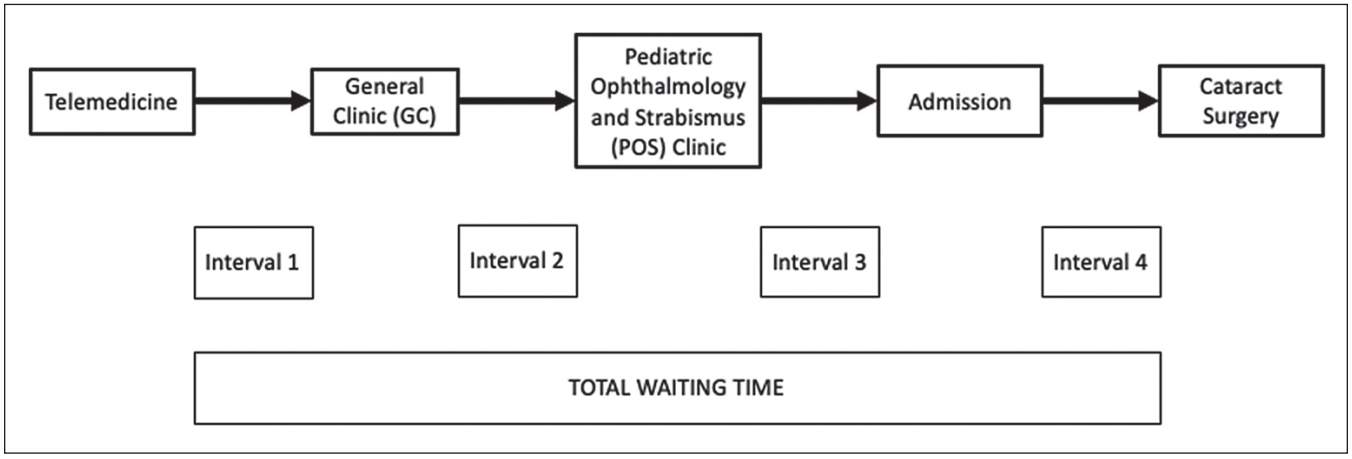

Figure 2. Visual representation of the steps during the pandemic.

Patients were stratified into two groups: (1) without delay and (2) with delayed surgery. Surgery without delay was operationally defined as total waiting time of two weeks or less from the time they sought consult at the general clinic because the minimum total waiting time for those without general clinic charts was three days, from general clinic to surgery was six days and from telemedicine to surgery was 12 days. Patients who waited beyond two weeks was defined as having delayed surgery.

Patients were further stratified into five different age groups: 0-12 months, >1 year old to 3 years old, >3 years old to 5 years old, >5 years old to 7 years old, and above 7 years of age, to eliminate the effect of age as a confounding factor. Patients were also grouped according to laterality and type of cataract.

Pre-operative and post-operative best corrected log MAR visual acuity were compared within each group to determine if delay in surgical intervention has a significant effect on the visual outcomes of patients. For patients with bilateral cataract operated at the same time, only the eye with better vision pre-operatively was selected for comparison. For patients with no equivalent log MAR visual acuity (such as dazzle and reacts to light), they were classified as having improved if there was any increase in visual acuity post-operatively, stable if visual acuity was the same, or deteriorated if there was any decline in visual acuity post-operatively.

The clinical profile of patients were summarized by descriptive statistics. Numerical variables were described as median and interquartile range, while categorical variables were described as frequency and percentage. The duration of the different intervals in the PGH process as well as the total waiting time were compared between pre-pandemic and pandemic period by Mann-Whitney U test. The duration of the total waiting time was compared between types of cataract by Kruskal-Wallis H test, followed by post-hoc analysis using Dunn test. The association between delay in cataract surgery and visual outcome was determined by Fisher exact test of association. Data analysis was performed using Stata version 17. All tests of hypothesis were evaluated against significance level of $\alpha = 0.05$.

RESULTS

One hundred ninety-seven (197) patients with pediatric cataract were included in the study. Median age at initial consult was 4.9 years (IQR 6.7, range 0.1-17.1). Median age at surgery was 5.2 years (range 0.2-17.7). Majority of patients were 7 years old and above (33.5%) followed by 1 year old and below (23.35%) (Table 1). Almost half of the patients had developmental cataract (50.25%). More than half of patients had bilateral cataract (61.93%). For bilateral congenital cataract, the median age at diagnosis was 0.9 years, while median age at surgery was 1 year old. For unilateral congenital cataract, the median age at diagnosis was 6.6 years old, while median age at surgery was 6.7 years old. For bilateral developmental cataract, the median age at diagnosis was 6.1 years old, while median age at surgery was 6.3 years old. For unilateral developmental cataract, the median age at diagnosis was 7.5 years old, while median age at surgery was 7.7 years old. Leukocoria is still the most common chief complaint (63.45%) followed by blurring of vision (26.90%). Pre-operatively, 94 patients had strabismus, 49 had eye preference, 48 had nystagmus, and 43 had amblyopia in the diagnosis.

In terms of geographic distribution, more than 90% of patients came from Luzon while only 4.6% came from both Visayas and Mindanao (Table 2).

For the duration of the different time intervals in the PGH process, the longest interval both pre-pandemic and during the pandemic was from POS clinic consult to admission with median waiting time of 50 days pre-pandemic and 32 days during the pandemic. There was significantly faster admission to cataract surgery during the pandemic compared to pre-pandemic period ($p<0.0001$) with median waiting time of two days during the pandemic (range 2-7) and three days during the pre-pandemic period (range 1-11). There was no sufficient evidence to conclude difference in the length of the following between pandemic and pre-pandemic period: GC consult to POS consult, POS consult to admission, and total waiting time (Table 3).

Patients with congenital cataract have significantly lower total waiting time compared to patients with developmental cataract ($p=0.0031$) and cataract from rubella syndrome ($p=0.0005$). Patients with developmental cataract have significantly lower total waiting time compared to patients with cataract from rubella syndrome ($p=0.0453$) (Table 4).

Only 32 patients (16.2%) were operated with no delay. Patients with no delay in surgery had an improved median VA from 1.6 to 0.52. Similarly, patients with delayed surgery had an improved median VA from 1.6 to 0.4. Forty patients had VA with no equivalent log Mar. Among these, 37 had delayed surgery while three had no delay. Among those with delayed surgery, 33 had improved VA (89.2%), while four had stable VA (10.8%) post-operatively. There were no patients with deteriorated VA. Among those with no delay, all patients had improved VA (3/3, 100%). Comparing the visual outcomes between patients with delay and without delay in surgery, there is no sufficient evidence to conclude that delay in surgery is significantly associated with poorer visual outcomes (Table 5).

Further stratification of the results by age-group and cataract etiology revealed that in unilateral congenital cataract including congenital rubella syndrome, there is significantly greater improvement in VA among those above 7 years without delay, compared to those with delay in the same age group. However, for the other age groups, there is no significant difference in VA. For unilateral developmental cataract and bilateral congenital cataract and rubella syndrome, there is no evidence for significantly different improvement in VA between with and without delay. For

bilateral developmental cataract, there is significantly greater improvement in VA among those above 3-5 years and above 7 years without delay, compared to those with delay in the same age groups. However, there is significantly greater improvement in VA among those above 5-7 years with delay, compared to those without delay in the same age group. In the >5-7 years age group without delay, there is better pre-operative median visual acuity (0.75) which could be the reason why there is less change in VA in this group compared to the group with delayed surgery (median pre-operative VA = 1.7) (Table 6).

DISCUSSION

Majority of our patients had their initial consult at more than 84 months of age (7 years) (33.50%) while only 23.35% were received at age 12 months old and below. There is delayed diagnosis and surgery for all cataract etiologies, with the most alarming being unilateral congenital cataract with median age at diagnosis of 79.2 months (6.6 years) and median age at surgery of 80.4 months (6.7 years). This is markedly delayed compared to other studies, such as in the UK with median age at surgery was 4.57 months in bilateral congenital cataract and 2.99 months in unilateral congenital cataract cases.[9] In the same study, they concluded that decreasing age at surgery is associated with better visual outcomes for bilateral cataract patients. Another study from India[10] showed a mean age at presentation of 53 months, mean age at diagnosis of 2.5 years and mean age at surgery of 55.2 months, which were all still better than our study. Our results are comparable to other developing countries, such as Rwanda with mean age at surgery of 6.6 years, and Nepal with 7 years. In Rwanda, the mean delay between start of symptoms and operation date was 4.9 years.[11] The authors attributed this delay to lack of equipment since essential vitrectomy equipment and know-how of pediatric cataract surgery only became available in their institution starting 2003.

Table 1. Clinical Profile of Patients with Pediatric Cataract in the PGH from January 2015 to June 2022 (n=197)

Profile	Frequency	%
Age at initial consult		
≤1 year	46	23.35
>1-3 years	27	13.71
>3-5 years	27	13.71
>5-7 years	31	15.74
>7 years	66	33.50
Sex		
Male	104	52.79
Female	93	47.21
Type of cataract		
Congenital	78	39.59
Developmental	99	50.25
Rubella syndrome	19	9.64
Laterality		
Unilateral	74	38.58
Bilateral	123	61.93
Clinical presentation		
Nystagmus	48	24.37
Amblyopia	43	21.83
Eye preference	49	24.87
Strabismus	94	47.72
IOL implantation		
With IOL	131	66.50
Without IOL	66	33.50
Chief complaint		
Leukocoria	125	63.45
Blurring of vision	53	26.90
Squinting	3	1.52
Strabismus	15	7.61
Glare	1	0.51

Table 2. Geographic Distribution of Patients with Pediatric Cataract in the PGH from January 2015 to June 2022 (n=197)

Region	Frequency	%
NCR	75	38.07
I	2	1.02
II	3	1.52
III	15	7.61
IVA	79	40.10
IVB	7	3.55
V	7	3.55
VI	3	1.52
VII	0	0.00
VIII	4	2.03
IX	0	0.00
X	1	0.51
XI	0	0.00
XII	0	0.00
XIII	1	0.51
BARMM	0	0.00

Table 3. Duration of the Different Intervals in the PGH Process

Interval	Pre-pandemic		Pandemic		*p*-value
	Median	IQR	Median	IQR	
Telemedicine to GC/POS consult (n=28)	-	-	7	12	-
GC consult to POS consult (n=160)	7	14	6	14.5	0.1875
POS consult to admission (n=197)	50	72	32	125	0.1856
Admission to cataract surgery (n=197)	3	1	2	1	<0.0001
Total waiting time	64	70	65	140	0.9039

Table 4. Comparison of Total Waiting Time by Type of Cataract

Type of cataract	Total waiting time	
	Median	IQR
Congenital (n=78)	43.5	63
Developmental (n=99)	65	122
Rubella syndrome (n=19)	113	100

** Kruskal-Wallis H test, p-value = 0.0010*
*** Post-hoc Dunn test:*
Congenital vs developmental, p-value = 0.0031
Congenital vs rubella syndrome, p-value = 0.0005
Developmental vs rubella syndrome, p-value = 0.0453

Table 5. Comparison of Visual Outcomes between Patients with Delay in Surgery and Patients without Delay in Surgery

	Without delay, n = 32		With delay*, n = 165		*p*-value
	Median	IQR+	Median	IQR	
Pre-operative log Mar VA	1.6	1.52	1.6	1.4	0.9479
Post-operative log Mar VA	0.52	1.42	0.4	1	0.6515

** Delayed surgery are patients with total waiting time > 2 completed weeks.*
*** Minimum total waiting time = 3 days (0 completed weeks).*
+IQR = interquartile range

Table 6. Comparison of Visual Outcomes between Patients with Delay in Surgery and Patients without Delay in Surgery in Different Age Groups and Cataract Subtypes

Age	Without delay		With delay		*p*-value
	Pre-op log Mar VA (IQR)	Post-op log Mar VA (IQR)	Pre-op log Mar VA (IQR)	Post-op log Mar VA (IQR)	
Unilateral Congenital and Rubella Syndrome					
≤1 year	0.18 (0)	0.18 (0)	1.6 (1.42)	0.3 (1.42)	>0.9999
>1-3 years	1.6 (0)	1.6 (0)	1.6 (0)	1.18 (0)	>0.9999
>3-5 years	-	-	1.79 (1.22)	1.5 (0.64)	-
>5-7 years	-	-	1.96 (1.05)	1.8 (1.35)	-
>7 years	2.4 (1.4)	1.82 (1.92)	2.4 (0)	2.3 (1.4)	0.0098*
Unilateral Developmental					
≤1 year	-	-	-	-	-
>1-3 years	-	-	1.3 (0.6)	1 (1.2)	-
>3-5 years	1.82 (2.12)	1.05 (1.5)	2.05 (1.46)	1.3 (1.41)	0.5312
>5-7 years	1.29 (2.22)	0.85 (1.7)	2.4 (1.7)	1.42 (2)	0.1562
>7 years	-	-	2.15 (1.1)	0.35 (0.44)	-
Bilateral Congenital and Rubella Syndrome					
≤1 year	1.6 (0.42)	1.6 (1.42)	1.6 (0.42)	1.18 (0.92)	0.5078
>1-3 years	1.18 (0.71)	1.09 (0.8)	1.6 (0.42)	1.6 (1.42)	0.1875
>3-5 years	-	-	1.6 (1.12)	1.18 (0.48)	-
>5-7 years	-	-	1.6 (0.8)	1 (1)	-
>7 years	-	-	1 (0.4)	0.4 (0.7)	-
Bilateral Developmental					
≤1 year	-	-	-	-	-
>1-3 years	-	-	0.18 (0.99)	0.18 (0)	-
>3-5 years	1.6 (0)	0.1 (0)	0.8 (0.82)	0.18 (0.2)	0.0039*
>5-7 years	0.75 (0.1)	0.2 (0.4)	1.7 (1.7)	0.3 (0.3)	0.0002*
>7 years	2.4 (0.87)	0.14 (0.31)	1 (0.76)	0.18 (0.14)	<0.0001*

**Statistically significant, p<0.05*

On initial presentation, nystagmus was found in 24.37% and strabismus in 47.72% in our study. These are indicators of prolonged stimulus deprivation and hence poor visual outcomes post-operatively. Yahalom et al.[12] found that presence of nystagmus is associated with poorer visual outcomes while strabismus is not. In their study, children who had nystagmus had 4.6 times higher chances of developing visual impairment compared to those without it.[12] This finding is in accordance with previously published studies and might suggest that nystagmus appears as the consequence of an early and severe disruption in visual development.[8,13–15] In addition to nystagmus, children with microphthalmos was associated with higher rates of visual impairment.[12]

In terms of geographical location, most of the patients came from Luzon. Some of the reasons for delay noted on chart review from the pre-pandemic period included lack of funding and delay in clearance. During the pandemic, cause of delays noted on chart review were due to the lockdown in March 2020, difficulty in transportation, and positive result of the nasopharyngeal SARS-CoV-2 RT-PCR.

Comparing the different intervals, the longest waiting time was the interval from POS clinic consult to admission. During this interval, patients were referred to pediatrics and anesthesiology for pre-operative clearance, and funding for the operation and admission was secured. During the pandemic, an additional requirement needed prior to admission included a negative nasopharyngeal SARS-CoV-2 RT-PCR result. This additional requirement did not cause further delay in surgery since there was no significant difference found in the waiting time before and during the pandemic. There was significantly shorter interval from admission to surgery during the pandemic compared to before which could be because of the additional requirement of pre-operative anesthesia clearance prior to admission. As long as patients were cleared on out-patient basis and have a negative swab result, patients can now be admitted 1-2 days prior to date of surgery, in contrast to previous practice of admitting the patient and facilitating the pre-operative clearance on admission. The current practice has an advantage of having a faster transit time for ward admissions but it had no significant effect in the total waiting time of patients.

In terms of cataract etiology, congenital cataract had the shortest waiting time followed by developmental cataract and rubella cataract. Despite having the shortest waiting time, median waiting time was still around six weeks from the time of diagnosis for congenital, nine weeks for developmental, and 16 weeks for rubella cataract. For rubella cataract, there was a longer waiting time because patients were managed in a multidisciplinary approach and referred to other comanaging services such as Uveitis, Otorhinolaryngology, Pediatric Cardiology and Pediatric Infectious Disease specialist.[16]

Patients were received late especially for congenital cataract patients which could be the reason why early surgery did not reflect better visual outcomes compared to delayed surgery. Only four patients were received before eight weeks of age (three bilateral and one unilateral congenital cataract). Among these, one was operated without delay, two within three weeks and one within seven weeks from initial consult. Two were operated before eight weeks of age, the other two were operated at 9 and 12 weeks, respectively. All of these patients had improvement of visual acuity post-operatively. Other studies revealed age at surgery as an important prognosticating factor for visual outcomes in pediatric cataract surgery.[9,12,13,17] In Chaudhary et al.'s study,[15] they found that age at presentation has a significant effect on visual outcome with better visual outcome in children more than 2 years but duration of symptoms to surgery has no significant association with visual outcome. There were also studies that postulated etiology, morphology, and laterality of cataract as important factors predictive of outcomes.[10,17] Other factors associated with poor post-operative visual acuity were poor compliance with occlusion, presence of additional medical conditions, and the presence of post-operative ocular complications.[9] In our study, delay in surgery did not affect visual outcomes for both unilateral and bilateral congenital cataract and unilateral developmental cataract. However, there was significantly better visual outcomes in patients with bilateral developmental cataract age 3-5 and >7 operated on early compared to those with delayed surgery. This could be because the earlier onset of cataract entailed more profound visual deprivation. Yahalom et al.[12] found that children who had surgery before the age of six months had 6.6 times higher risk of poor visual outcome compared with those who had surgery after six months of age but there was no mention regarding the age of onset of cataract in these children so it is possible that children operated before six months had earlier onset of visual deprivation than those operated after six months which could account for the poor visual outcomes. In Bonaparte et al.'s study,[13] they found that surgery at <1 year of age yielded poorer visual outcome which they attributed to cataracts present during infancy disrupting visual development more than cataracts that first appear after the early sensitive years of visual maturation. This stresses the importance of having a normal visual experience in the first year of life.

CONCLUSIONS

There is delayed age of diagnosis and age of surgery of pediatric cataract patients in the Philippine General Hospital. Congenital cataract had the least waiting time, followed by developmental, and lastly rubella cataract, at 43.5, 65 and 115 days respectively. There is significantly shorter admission to surgery during the pandemic but no difference in total waiting time between the pre-pandemic and pandemic period. Congenital cataract and unilateral developmental cataract patients without delayed surgery did not have better visual outcomes after cataract surgery. Only patients with bilateral developmental cataract patients aged >3-5 years and >7 years operated on early showed better vision.

Limitations

Limitations of our study include the retrospective nature of the study that limited us in obtaining important information such as actual onset of visually significant cataract, percentage of visual axis obscured, compliance to occlusion therapy, spectacles or contact lenses, and others. Vision of preverbal children were converted to log MAR equivalent of the best possible visual acuity potential and may not be the most accurate measurement of visual acuity. We were not able to quantitatively analyze results from children with vision not convertible to log MAR (such as "dazzle" or "responds to light"). Also, surgeries were performed by different surgeons. However, all surgeons were assisted by a trained pediatric ophthalmologist or pediatric ophthalmologist trainee with special expertise in pediatric cataracts.

Recommendations

A prospective study is still recommended to get a more accurate visual acuity representation, and to take note of other possible factors that might affect visual outcomes such as density of cataract, cataract morphology, percentage of visual axis obscuration, IOL implantation, primary posterior capsulotomy, anterior vitrectomy, aphakic correction, and compliance to occlusion therapy. A prospective study will also ensure uniformity in the procedure of lens extraction. Lastly, our study showed that there is no significant difference in visual outcomes between patients with delay and without delay in surgery because patients are received late, hence the importance of earlier consultation especially for congenital cataract, should be emphasized.

Statement of Authorship

Both authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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REFERENCES

1. Medsinge A, Nischal KK. Pediatric cataract: challenges and future directions. Clin Ophthalmol. 2015 Jan 7;9:77–90. doi: 10.2147/OPTH.S59009. PMID: 25609909; PMCID: PMC4293928
2. Sheeladevi S, Lawrenson JG, Fielder AR, Suttle CM. Global prevalence of childhood cataract: a systematic review. Eye (Lond). 2016 Sep;30(9):1160-9. doi: 10.1038/eye.2016.156. PMID: 27518543; PMCID: PMC5023808.
3. Tecson JV III, Santiago APD. Profile of childhood cataract cases at the Philippine General Hospital. Philipp J Ophthalmol. 2004 Jul-Sep;29(3):140-3.
4. Wilson ME, Pandey SK, Thakur J. Paediatric cataract blindness in the developing world: surgical techniques and intraocular lenses in the new millennium. Br J Ophthalmol. 2003 Jan;87(1):14–9. doi: 10.1136/bjo.87.1.14. PMID: 12488254; PMCID: PMC1771478.
5. Lambert SR. The timing of surgery for congenital cataracts Minimizing the risk of glaucoma following cataract surgery while optimizing the visual outcome. J AAPOS. 2016 Jun;20(3):191–2. doi: 10.1016/j.jaapos.2016.04.003. PMID: 27180288; PMCID: PMC5018898.
6. Birch EE, Cheng C, Stager DR Jr, Weakley DR Jr, Stager DR Sr. The critical period for surgical treatment of dense congenital bilateral cataracts. Journal of AAPOS. 2009 Feb;13(1):67–71. doi: 10.1016/j.jaapos.2008.07.010. PMID: 19084444; PMCID: PMC3310432.
7. Eugenie Hartmann E, Lynn MJ, Lambert SR; Infant Aphakia Treatment Study Group. Baseline characteristics of the infant aphakia treatment study population: Predicting recognition acuity at 4.5 years of age. Invest Ophthalmol Vis Sci. 2014 Dec 11;56(1):388–95. DOI: 10.1167/iovs.14-15464. PMID: 25503455; PMCID: PMC4296771.
8. Lambert SR, Lynn MJ, Reeves R, Plager DA, Buckley EG, Wilson ME. Is there a latent period for the surgical treatment of children with dense bilateral congenital cataracts? J AAPOS. 2006 Feb;10(1):30–6. doi: 10.1016/j.jaapos.2005.10.002. PMID: 16527677.
9. Chak M, Wade A, Rahi JS; British Congenital Cataract Interest Group. Long-term visual acuity and its predictors after surgery for congenital cataract: Findings of the British Congenital Cataract Study. Invest Ophthalmol Vis Sci. 2006 Oct;47(10):4262–9. doi: 10.1167/iovs.05-1160. PMID: 17003414.
10. Khanna RC, Foster A, Krishnaiah S, Mehta MK, Gogate PM. Visual outcomes of bilateral congenital and developmental cataracts in young children in south India and causes of poor outcome. Indian J Ophthalmol. 2013 Feb;61(2):65–70. doi: 10.4103/0301-4738.107194. PMID: 23412523; PMCID: PMC3638328.
11. de Smedt S, Ngabonziza I, Speybroeck N, Fonteyne Y, Baptiste Minani J, Noë P, et al. Visual and functional outcome of pediatric bilateral cataract surgery with intraocular lens implantation in Rwanda. Int J Ophthalmol Clin Res. 2016 Dec;3(4):E1-7. doi: 10.23937/2378-346X/1410065.
12. Yahalom C, Kochavi MM, Mechoulam H, Cohen E, Anteby I. Prevalence and factors related to visual impairments in children with bilateral cataract following surgery and the potential need for education and rehabilitation services. J Vis Impair Blind. 2022 Jan 1;116(1):61–9. doi:10.1177/0145482X211073588.
13. Bonaparte LA, Trivedi RH, Ramakrishnan V, Wilson ME. Visual acuity and its predictors after surgery for bilateral cataracts in children. Eye (Lond). 2016 Sep;30(9):1229–33. doi: 10.1038/eye.2016.166. PMID: 27472217; PMCID: PMC5023814.
14. Robb RM, Petersen RA. Outcome of treatment for bilateral congenital cataracts. Ophthalmic Surg. 1992 Oct;23(10):650-6. PMID: 1436963.
15. Chaudhary S, Lavaju P, Shrestha BG, Shah S, Chaudhary SK. Factors affecting the visual outcome of pediatric cataract surgery: a hospital based prospective study in eastern Nepal. Nepal J Ophthalmol. 2017 Jul;9(18):143-8. doi: 10.3126/nepjoph.v9i2.19258. PMID: 29634703.
16. Santos-Gonzales MAM. Pediatric Cataracts and Lens Abnormalities. In: Santiago APD, Valbuena MN, editors. Pediatric Ophthalmology and Strabismus: A Comprehensive Guide to Diagnosis and Management. 1st ed. Manila, Philippines: DOVS UP Manila College of Medicine; 2022. pp. 126–8.
17. Shah MA, Shah SM, Shikhangi KA, Upadhyay PR, Bardoloi GB. Factors affecting visual outcome following surgical treatment of cataracts in children. Open J Ophthalmol. 2012 Nov;2(4):131–9. doi: 10.4236/ojoph.2012.24029.