LGU Journal of
LIFE SCIENCES

LGU Society of Life Sciences

DOI: https://doi.org/10.54692/lgujls.2022.0603220

Research Article
Vol 6 Issue 3 July - September 2022

LGU J. Life. Sci
ISSN 2519-9404
eISSN 2521-0130

Prevalence of Congenital Cataract and Lens Extraction in Lahore Population

Shagufta Naz[*], *Nimrah Fiaz Sandhu, Eesha Sajjad, Saima Sharif, Iram Arshad*
Department of Zoology, Lahore College for Women University, Jail Road Lahore, Pakistan.
***Corresponding Author's Email ID: shagufta6@gmail.com**

ABSTRACT: *Congenital cataracts account for one-third of infant blindness globally and are one of the leading cause of vision loss in children. A retrospective study was performed between October 2020 and April 2021 on congenital cataract patients of Lahore visited ophthalmologic consultation at the Al Ehsaan eye hospital, General Hospital and Mayo hospital. The purpose of the study was to find the prevalence of congenital cataract in children. About 100 cases of congenital cataract including both male and female children were identified from age group of 1-13 years. Congenital cataract was diagnosed using Snellen's visual acuity test, ophthalmoscope and slit lamp test. Male children showed greater prevalence of congenital cataract as compared to female children. The prevalence of congenital cataract in male children was 55% (n=55) while among female children, it was 45% (n=45). Both conditions of unilateral and bilateral congenital cataract were observed with incidence of 46% (n=46) and 54% (n=54) in male and female children respectively. Lens extraction was also done in 94% (n=94) and after surgery 55% (n=52) patients showed positive response and 45% (n=42) patient had negative response for light perception. Moreover, most patients of congenital cataracts were of less than 1 year of age group. It was concluded congenital cataract may lead to childhood blindness if not treated on time.*

Keywords: Prevalence, Congenital, Cataract, Ophthalmoscope, Snellen chart

INTRODUCTION

The visual system is a component of the central nervous system that allows organisms to process visual information. The eyes are organs that detect light and convert it into neuronal electrochemical

signals. The crystalline lens is vital in vertebrates' refractive vision because it allows for changeable fine focusing of light onto the retina (Alan Shiels and Fielding, 2017). The ocular lens focuses light passing through it onto the retina, where photoreceptors detect it and convert it to visual signals (Wride, 2011).

The term "cataract" refers to a clouding of the lens. Visual disturbances are the most common symptom of cataract because light must travel through the lens to reach the retina. Cataracts can harm one or both eyes and develop slowly. Inherited cataracts account for a major portion of the global cataract burden (Shiels et al., 2010). The primary global cause of paediatric reversible blindness is congenital cataract. Congenital cataract prevalence varies by country's socioeconomic position, ranging from 1-6/10,000 live births in wealthy nations to 5-15/10,000 live births in undeveloped nations (Saba and Irshad, 2022). A cataract that goes unnoticed in an infant might result in lifelong vision loss. Unilateral cataracts are mainly infrequent and isolated events. Bilateral cataracts are frequently inherited and linked to other illnesses. While promising novel ways to treating cataract have been proposed in recent years (Zhao et al., 2015; Hayashi et al., 2016), surgical intervention remains the only treatment option for cataract, costing approximately $6.8 billion annually in the United States alone (Brown et al., 2013).

Congenital cataract can arise alone or in combination with other ocular or developmental problems. It has an estimated incidence of 2.2 to 2.49 per 10,000 live births in UK (Rahi et al., 2001). Congenital cataracts account for about 10% of all vision loss in children around the world. Approximately half of all congenital cataract instances could have a genetic origin, which could be highly diverse. Different mutations in the same gene have been shown to induce similar cataract patterns. This condition can be cured by removing the lenses. In one study, 24 children had their cataracts removed during their first year of life. In another study, 16 children were diagnosed and had surgery during their first two months of life. None of them, however, can achieve central fusion (Anna and Ulla, 2002).

This study was performed between October 2020 and April 2021 on congenital cataract cases from General hospital, Mayo hospital and Al Ehsaan eye hospital. The research was aimed to evaluate the prevalence of congenital cataract patients in Lahore. The

evaluation was based on the techniques like Snellen chart, ophthalmoscopy and slit lamp examination.

MATERIALS AND METHODS

Patients of congenital cataracts were examined by visiting General hospital, Mayo hospital and Al Ehsaan eye hospital Punjab, Pakistan. Performa's having information about the age, diagnosis, family history and clinical signs were distributed among the patients. A consent form was filled with each patient guardian to gather complete information about the patients of congenital cataract.

Study Variables

With the help of ophthalmologists, examination of each affected individual was done through slit lamp, visual acuity test and ophthalmoscope. The variables examined were age, gender, unilateral/ bilateral cataract, lens extraction, light perception.

Statistical Analysis

Chi-Square test was applied using SPSS version 26.0 and comparison between age and light perception after surgery in congenital cataract patients was done.

Age (Years)	N
≤ 1	28
2 – 3	23
4 – 5	14
6 – 7	17
8 – 9	9
10 – 11	7
12 – 13	2
Total	**100**

RESULTS

The study remained continue for 7 months and 100 cases of congenital cataract were identified in which 55% (n=55) were male and 45% (n=45) were female patients. The patients with ≤1-13 years of age were examined. The average age was 2-3 years with range of ≤ 1-7 years. The most represented age group was ≤1 year which included 28% (n = 28) patients followed by patients of age 2-3 years which included 23% (23%) patients. There were 40 (40%) patients from 4-9 years and 9 (9%) patients from 10-13 years of age. Age distribution of patients with congenital cataract illustrated in table 1.

Table 1: Age distribution of patients with congenital cataract

Prevalence of congenital cataract in males and females according to age

Males counted more for congenital cataract were 55% (n=55) of the study sample as compared to the females which included 45% (n=45). Age

distribution of male and female patients with congenital cataract described in fig. 1(a and b).

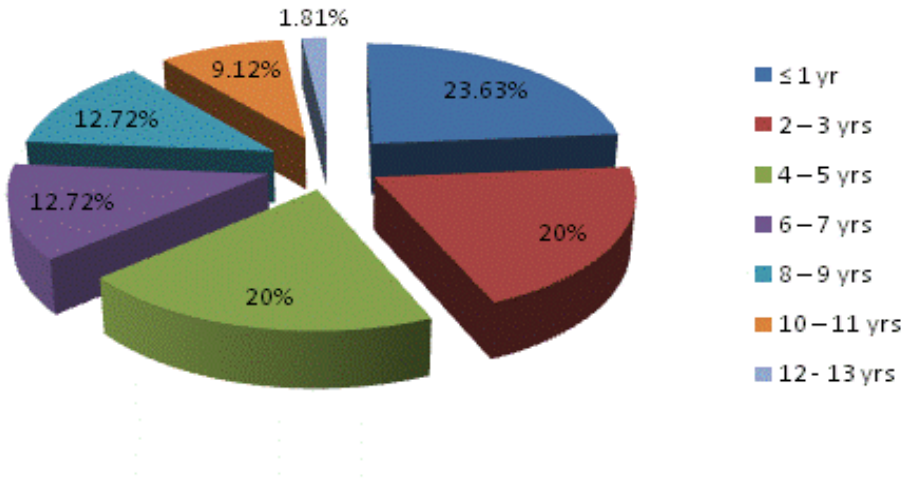

Fig. 1. (a) Age distribution of male patients with congenital cataract

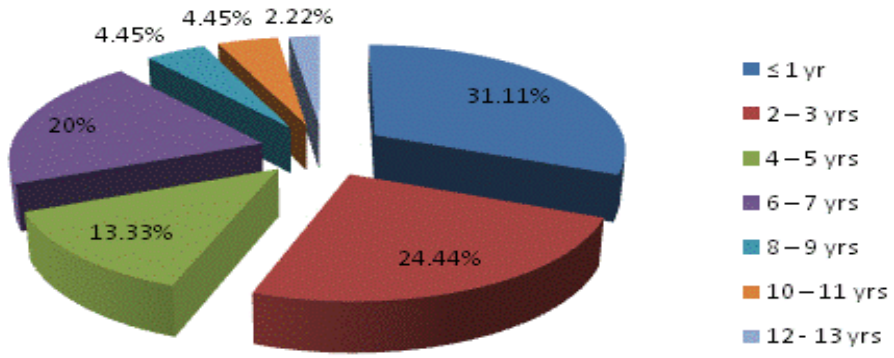

Fig. 1. (b) Age distribution of female patients with congenital cataract

Age distribution of males and females according to types of cataracts

The unilateral congenital cataract was observed in 46% (n=46) patients and prevalence of bilateral congenital cataract was 54% (n=54). There were 46 patients of unilateral congenital cataract out of which 52.17% (n=24) were male patients and 47.82% (n=22) were female patients. The number of male patients having unilateral congenital cataract was greater than female patients. Age distribution of male patients (a) and

female (b) with unilateral congenital cataract illustrated in fig. 2.

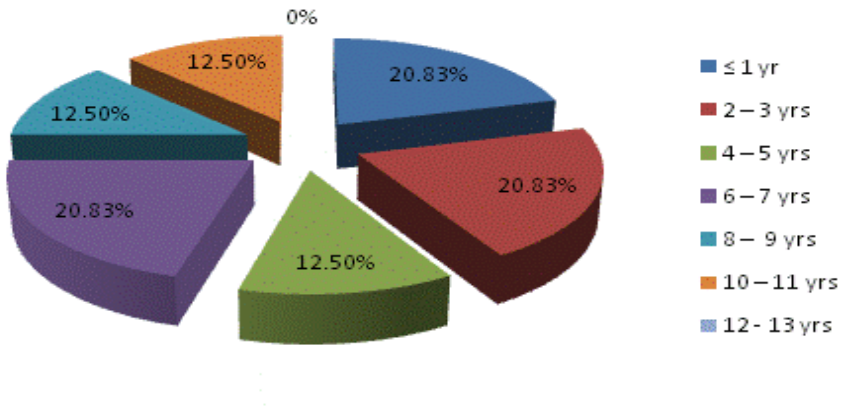

Fig. 2. (a) Age distribution of male patients with Unilateral Congenital cataract

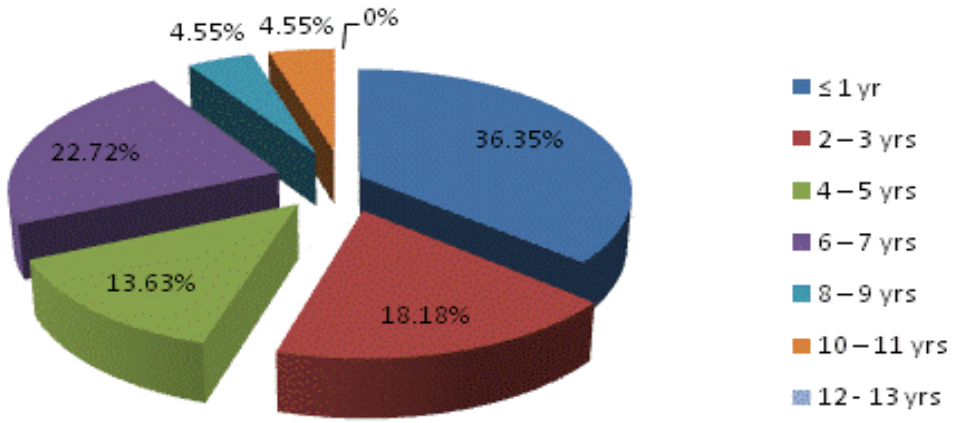

Fig. 2. (b) Age distribution of female patients with Unilateral Congenital cataract

There were 54 patients of bilateral congenital cataract out of which 57.40% (n=31) were males and 42.59% (n=23) were females. The prevalence of male patients for bilateral congenital cataract is more than females. Age distribution of male (a) and female (b) patients with bilateral congenital cataract illustrated in fig. 3.

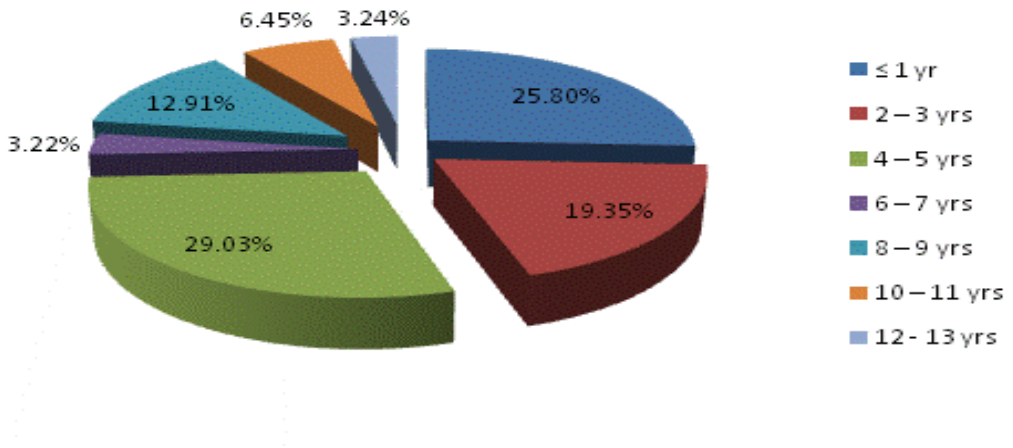

Fig. 3. (a) Age distribution of male patients with bilateral congenital cataract

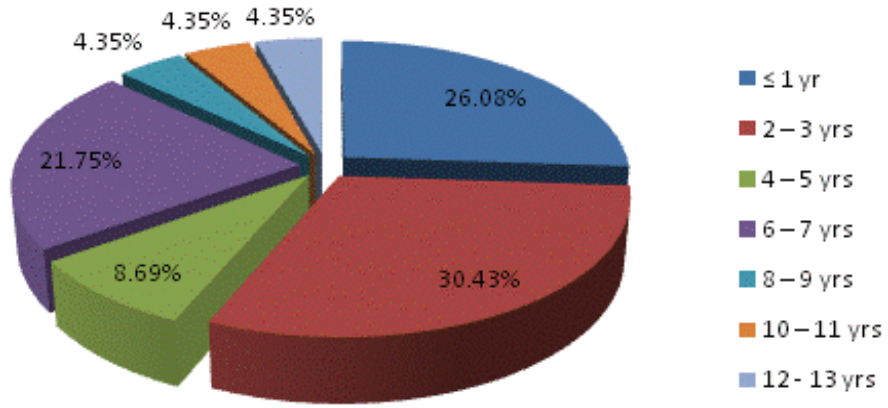

Fig. 3. (b) Age distribution of female patients with bilateral congenital cataract

Patients with and without light perception after surgery

Out of 100 patients observed, 94 patients were subjected for surgery. In these patients 55.31% (n=52) were having light perception after surgery whereas 44.68% (n=42) were not having light perception even after surgery. Age distribution of patients with and without light perception after surgery has been described in Table 2.

Table 2: Age distribution of patients with and without light perception after surgery

Age (Years)	With light perception	Without light perception
	N (%)	N (%)
≤ 1	8 (15.39%)	17 (40.47%)
2 – 3	10 (19.23 %)	11 (26.19 %)
4 – 5	9 (17.31 %)	8 (19.04%)
6 – 7	12 (23.07 %)	3 (7.15%)
8 – 9	5 (9.61 %)	3 (7.15%)
10 – 11	7 (13.46%)	0 (0 %)
12 – 13	1 (1.93%)	0 (0 %)
Total	**52 (100 %)**	**42 (100%)**

In total 100 cases of cataract lens extraction had done in 94 patients out of whom 52 patients were having light perception after surgery and 42 showed negative response. In light perception cases the incidence of male patients was 50% (n=26) and female had 50% (n=26) prevalence. For those 42 patients that were not having light perception were 64.28% (n=27) males and 35.71% (n=15) females. Out of 6 patients in which the lens extraction was not done, 33% (n=2) were males and 67% (n=4) were females.

In 52 patients that were having light perception after surgery, the most represented age group was 4-7 years with 26 (50%) patients followed by ≤ 1-3 years with 18 (34.62%) and 8-13 years with 13 (25%) patients. For those 42 patients that were not having light perception after surgery, the most represented age group was ≤ 1-3 years with 28 (66.66%) patients followed by 4-9 years with 14 (33.33%) patients and no patient of 10-13 years was observed. The most significant age for not having light perception after surgery was ≤1 year. Age distribution of male and female patients with light perception after surgery is explained in fig. 4.

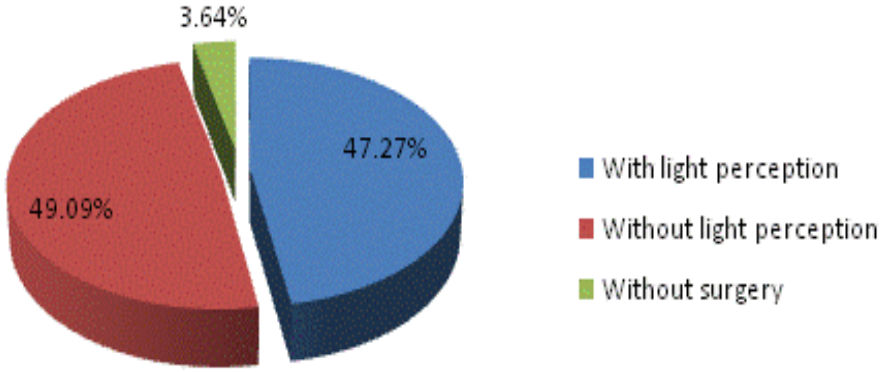

Fig. 4. (a) Age distribution of male patients with light perception after surgery

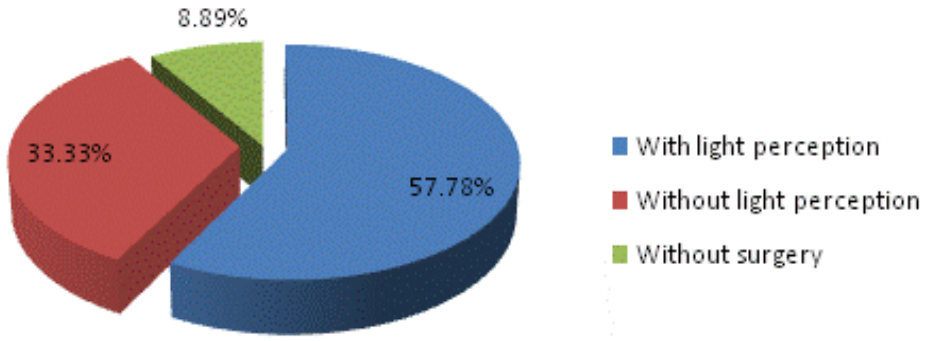

Fig. 4. (b) Age distribution of female patients with light perception after surgery

Chi-Square test was applied and comparison between age and light perception after surgery in congenital cataract patients was done. This test showed significance of 0.080 and 0.002 in males and females respectively. The Chi-square test on comparison between gender and light perception after surgery in congenital cataract patients showed significance of 0.000 in both males and females respectively.

DISCUSSION

Congenital cataract is one of the most common causes of curable childhood blindness (Pi et al., 2012), with varying rates of occurrence. In the United States, the frequency of congenital cataract ranges from 1 to 15 per 10,000 children (Foster et al., 1997), the incidence is 2.0 per 10,000 births (Haargaard et al., 2004). In China, the incidence of congenital cataract is about 5.0 per 10,000 births (Nie et al., 2008), and 22 percent to 30 percent of childhood blindness (Zhu et al., 2012) is attributed to congenital cataract in the absence of appropriate treatment, with delayed presentation to hospitals and late surgical treatments being the major causes of blindness and visual impairment (You et al., 2011).

In Asia, pediatric cataracts are responsible for over a million cases of infantile blindness. Cataract causes 7.4-15.3 percent of childhood blindness in underdeveloped nations like India. Children's cataract prevalence has been estimated to be between 1 and 15 per 10,000. According to our data, congenital cataract is greater in newly born children and diagnosed mostly at the age of ≤1 year. This group constituted 28% of total congenital cataract patients. Due to the genetic nature of congenital cataract, the patients having this disease may witness the loss of vision by other family member. Out of 100 patients, the mean age group was 2.85 of 1-7 years with significance of 0.000. The comparison between age groups and gender was conducted in which male patients showed the significance of 0.042 and females showed 0.001. Unilateral congenital cataract patients showed the significance of 0.913 in males and 0.086 in females. Bilateral congenital cataract showed significance of 0.022 and 0.088 for males and females respectively.

The aim of this study was to find prevalence of congenital cataract in Lahore population. This study was conducted by visiting different hospitals of Lahore. In our large-population, hospital-based study, we found that congenital cataract patients accounted for 100 patients of the total patients in 7 months visit and bilateral congenital cataracts was more as compared to unilateral congenital cataract due to genetic heterogeneity.

CONCLUSION

This study included 100 cases of congenital cataracts among which more incidence was found in males as compared to females. Incidence of bilateral congenital cataract was more as

compared to unilateral congenital cataract. However, after surgery lens extraction showed more light perception response. Most patients of congenital cataracts were of less than 1 year of age group. It included 28% (n=28) of patients. It is important to diagnose the disease at early stage of life because visual impairment at an early age has far reaching implications on a child's life.

Acknowledgement

We are thankful to the patients and families for providing us the data. We are also very thankful to the staff of hospitals for their cooperation.

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