

Epidemiology of childhood cataracts

Tevfik Oğurel, Gülsun Solmaz, Erdem Dursun

Department of Ophthalmology, Faculty of Medicine, Kırıkkale University, Kırıkkale, Türkiye

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Corresponding Author: Tevfik Oğurel, ogureltevfik@hotmail.com

ABSTRACT

Aims: The aim of the study was to investigate the epidemiologic characteristics of pediatric patients with cataracts and to make a statistical comparison.

Methods: The study included 25 eyes of 19 children aged 16 years and younger who presented to Kırıkkale University, Faculty of Medicine, Department of Ophthalmology with visual complaints between April 2018 and November 2023. The information about the patients was obtained and recorded by scanning the patient files. The patient data included age, gender, cataract type, trauma history, medical history, family history, and surgical intervention.

Results: In the study, 25 eyes of 19 children were examined. Eleven (57.9%) of the patients were girls, and eight (42.1%) were boys, with a mean age of 4.74 ± 4.22 years (0.2-14). When all age groups were compared, there was no statistically significant difference between boys and girls in the incidence of childhood cataracts ($p=0.532$). Both eyes were affected in 5 children (26.3%), the right eye in 8 (42.1%), and the left eye in 6 (31.6%). Regarding etiology, 5 were idiopathic, 4 were genetic, 2 were metabolic syndrome, 2 were steroid-induced, and 6 were traumatic.

Conclusion: Congenital cataracts are the most common type of cataract seen in early childhood. Etiological causes in childhood cataracts differ from adult cataracts.

Keywords: Congenital cataracts, epidemiologic characteristics, statistical comparison

INTRODUCTION

Cataract is a condition in which the transparent lens becomes opaque. Pediatric cataracts are cataracts seen between the ages of 0-16 years, of which congenital cataracts seen in early childhood are the most common.^{1,2} The prevalence of pediatric cataracts is estimated to be between 2.2 and 13.6 per 10,000 children worldwide.³

The etiology of pediatric cataracts is variable. The most common etiology is idiopathic, followed by genetic and infectious causes.⁴ Globe trauma plays an important role in the etiology of cataracts in advanced childhood, and this rate is higher in developing countries.⁵

Cataract-related conditions in childhood pose a huge problem in terms of morbidity, economic loss, and social isolation. Due to the life expectancy of the pediatric population, restoring the vision of a child blinded by cataract is equivalent to restoring it in 10 adult patients.⁶ Especially since early childhood is the period of visual development, delays in diagnosis and treatment may lead to amblyopia, unlike adults. This means that,

unlike adults, treatment does not end with surgery and requires a long treatment and follow-up period for visual rehabilitation.

The aim of this study is to describe the epidemiology of cataract in children aged 16 years and younger evaluated at Kırıkkale University Faculty of Medicine, Department of Ophthalmology, which is located in Central Anatolia and provides tertiary care for the surrounding provinces, over a period of 5 years. This study also examines the frequency, causes, and treatment outcomes of cataracts in children.

METHODS

Ethics

The study was initiated with the approval of the Kırıkkale University Medical Faculty Clinical Researches Ethics Committee (Date: 17.04.2024, Decision No: 2024/06). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.



Patients and Methods

The study included 25 eyes of 19 children aged 16 years and younger who presented to Kırıkkale University, Faculty of Medicine, Department of Ophthalmology with visual complaints between April 2018 and November 2023. Patient information was recorded by scanning patient files. The extracted patient data included age, gender, cataract type, trauma history, medical history, family history, and surgical intervention. Biomicroscopic examinations, including dilated fundus examinations, were noted in detail. Medical and surgical histories were noted if additional surgery was required. Children were divided into three age groups: 0-5 years (infancy and preschool), 6-10 years (primary education), and 11-14 years (secondary education).

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics 20. Frequency distributions were generated for cataract type and cause. A statistical analysis of quantitative data was performed for all variables. Frequency analysis was performed with the chi-square test. P-values of 0.05 and lower were considered statistically significant.

RESULTS

The study included 25 eyes from 19 children. Eleven (57.9%) were girls and 8 (42.1%) were boys, with a mean age of 4.74 ± 4.22 years (0.2-14). The most common age at diagnosis was in the 0-5 age group, with 63.2% (n=12). This was followed by children aged 6-10 years (26.3%, n=5) and 11-16 years (10.5%, n=2) (Table). When all age groups were compared, there was no statistically significant difference between boys and girls in the incidence of childhood cataracts (p=0.532). Both eyes were affected in 5 children (26.3%), the right eye in 8 (42.1%), and the left eye in 6 (31.6%).

Table. Demographic characteristics of childhood cataracts	
Characteristics	Number (%)
Age	
0-5	12 (63.2%)
6-10	5 (26.3%)
11-16	2 (10.5%)
Gender	
Male	8 (42.1%)
Female	11 (57.9%)

Regarding etiology, 5 were idiopathic, 4 were genetic, 2 had metabolic syndrome, 2 were steroid-induced, and 6 were trauma-induced (Figure). All idiopathic cases were consulted to the pediatric department for underlying metabolic or genetic factors and a systemic investigation was performed.

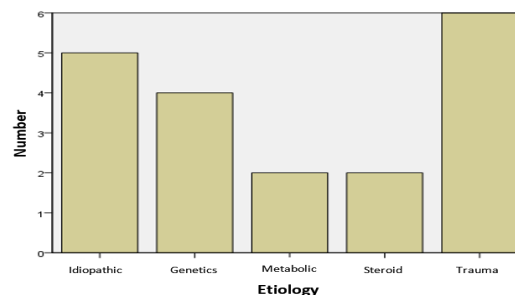


Figure. Distribution of cataracts in children according to causes

Of the traumatic patients, 2 developed cataracts after blunt trauma, and 4 had penetrating trauma. Two patients had Down syndrome, and two patients had cataracts due to nephrotic syndrome caused by long-term steroid use. Both of the patients with metabolic syndrome were followed up with diet because of galactosemia, and all other patients underwent surgery. Due to the age of the patients or corneal perforation, 9 patients were left aphakic, and secondary IOL implantation was performed in a second session. The average age of patients who had lenses placed in the second session was 3.77 ± 2.45 years.

The most common accompanying ocular findings were strabismus (42.1%) and nystagmus (26.3%). 3 (15.7%) patients had microphthalmia.

DISCUSSION

There is a critical period of visual development during which any damage that causes a change in the normal visual stimulus (unilateral or bilateral) leads to the emergence of amblyopia. The most vulnerable period is observed in the first 3 years of life.^{7,8} Therefore, the main aim of early diagnosis of cataracts is to prevent irreversible complications, especially amblyopia, which directly affects the visual prognosis of the child. In our study, amblyopia was present in all patients whose visual acuity was evaluated.

The percentage of blindness due to lens problems is around 7%,⁹ making it a very important cause of preventable blindness. The detection of cataracts requires some basic parental awareness. If parents lack this education, cataracts may go unrecognized and lead to delays in diagnosis. In four of the patients in our study, the diagnosis was made during routine ophthalmologic examinations, independent of visual complaints.

Children with acquired cataracts have very good vision and are therefore often recognized late. Teachers play an important role in the diagnosis of acquired cataracts.¹⁰ Therefore, school vision screening programs and teacher training are very important for the detection of visual pathologies in children.

The most important cause of acquired cataracts in children is childhood ocular trauma.¹¹ Similarly, trauma was the cause of 6 of 8 patients with acquired cataracts in our study. Although studies have shown that cataract development due to childhood trauma is 10 times more common in males,^{12,13} it was found to be equal in our study. However, this may be

due to the small sample size. Traumatic cataracts also tend to occur at older ages [mean age (78.5 months)].¹⁴ In our study, the mean age of children with cataracts due to trauma was 6.33 ± 4.08 years.

Another cause of acquired cataracts in our study was steroid-induced cataracts due to chronic drug use. In the prevention of this type of cataract, routine ophthalmologic examinations should be included in the treatment program for chronic use of drugs with known side effects.

While the most common cause of cataract in adulthood is senility, it may vary in childhood, as can be seen in our study. While the timing of surgery does not matter in adults, early intervention is especially important in children as it is an important period of vision development.

CONCLUSION

Although early diagnosis and treatment of childhood cataracts is associated with good visual outcomes, delay in diagnosis and, therefore, delay in surgery is a major public health problem. Awareness-raising among target groups is crucial to improving the prognosis of childhood cataracts.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was initiated with the approval of the Kırıkkale University Medical Faculty Clinical Researches Ethics Committee (Date: 17.04.2024, Decision No: 2024/06).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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