AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 3, Issue 12, 2025 ISSN (E): 2993-2149

Patterns of Presentation, Morphology, and Referral in Pediatric Cataract: A Tertiary Center Study in a High-Consanguinity Population

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Abstract: Background

Cataracts in children are a disease of outstanding etiology in terms of childhood blindness among all etiologic factors globally, and a disproportionately high burden in low-resource environments. Diagnostic and treatment lag times, caused by a paucity of screening facilities, a deficiency of collective awareness, and permeated by socioeconomic imperatives, make the visual morbidity of this disorder in Iraq largely disproportionate.

Aim of the study

The key purpose of the study was to assess and define the nature of clinical presentation of cataracts among children who presented in the Pediatric Ophthalmic Units of two leading tertiary care facilities in Baghdad.

Patients and methods

The cross-sectional observational study was conducted in Ibn Al Haitham Teaching Eye Hospital and Ghazi Surgical Specialties between September 2024 and April 2025. The sample included pediatric patients aged 1day to 12 years who had a positive diagnosis of cataract. The data on factors such as age at presentation, laterality, morphological subtype, family history, consanguinity, systemic and ocular association, and antecedent TORCH infections were accumulated using structured questionnaires and thorough clinical examination.

Results

The analysis consisted of 84 pediatric patients (138 eyes) with cataract. Early presentation was predominant, with 28.6%♀ of the cases presenting before or at 6 months of age, and a minor male dominance (52.4%). The commonest type of cataract was nuclear morphology (26.8portein), mixed (18.1portein), and total cataracts (18.1portein). The most common symptom

reported was leukocoria (42.9. %), especially in males (p= 0.023), and a decline in visual acuity was more often reported in females (p= 0.015). The history of trauma rose considerably with age (p 0.001), and the use of systemic medications, in particular, steroids, was the highest in children aged 7 years to 9 years.

Conclusion

The paediatric cataract features were dependent on age and gender, where Leukocoria was found to be more common among the younger male population, whereas poor visual acuity was higher among the older female population. High consanguinity and familial predisposition rates indicate a significant genetic factor, and delays in the diagnosis of older children indicate significant gaps in standard pediatric eye screening processes.

Keywords: Patients, Cataract, Nuclear Morphology, Paediatric, Cataract, Genetic, Eye.

Introduction

Cataract is the clouding of the eye lens, which is causing either partial or total blindness. Congenital and developmental cataracts are both key contributors to childhood blindness that are both preventable worldwide. Cataract is estimated to render sightless approximately two hundred thousand children each year, all over the world, with another 20,000 to 40,000 cases of congenital cataract being reported every year. One point eight-to-three-point six childhood cataract cases are universal per 10,000 live births. Current epidemiological data have given much emphasis on congenital cataract, with little or no emphasis given to developmental cataract, which is also the reason the prevalence of the latter has not been well documented, and this may be because of inherent problems with categorizing and differentiating them. Blindness caused by pediatric cataract causes a high burden to the developing nations, which translates to high morbidity in humans, loss in the economy, and suffering in social life [1,2,3,4].

Since the visual impairment may be irreversible, it is important to diagnose and manage the condition as early as possible so as to maximise the visual prognosis. The chronic presence of unilateral or bilateral cataract in childhood may affect the visual apparatus, which in most cases leads to amblyopia. In contrast to most of the adult conditions, early cataract diagnosis among the pediatric population is critical to the positive postoperative visual performance [5]

Although caregivers are indispensable during the identification of the condition, they are often not aware of how to identify lenticular opacities. Even in the case of early detection of cataract, there are often health care access obstacles and economic factors that do not allow for medical treatment early. A cataract is an opacous lens which causes partial or complete visual impairment. The pediatric cataracts are classified into two main classes, namely congenital cataracts, which are diagnosed at the age of at most 2 months with an association of nystagmus but do not have any other pathology; and developmental cataracts, which are diagnosed later at the age of at least 2 months of age, having a zonular pattern without nuclear involvement [6,7,8].

Cataracts in the postnatal phase can be either unilateral or bilateral. They morphologically fall into a number of types, which include total, nuclear, posterior subcapsular, anterior polar, anterior polar, zonular, lamellar, pulverulent, sutural, cerulean, corraliform, and polymorphic [9,10].

Childhood blindness affects more than one million children in Asia, with pediatric cataract being the major cause. Childhood cataract is the leading cause of blindness in developing countries like India, accounting for 7.4 to 15.3 percent of the total of incidence of blindness in children, significantly decreases the years of quality life. Childhood cataract is quite common in developing countries, which is mainly because of low living standards, and seems to be not affected by other factors such as sex or educational level in the society. [11,12]

Congenital cataract is heterogeneous in etiology, with 62.2% of all cases being idiopathic, the remaining 22.3% and 11.5% being hereditary and non-hereditary, respectively, and metabolic, traumatic, infectious, secondary cataract, and many associative syndromes. Genetic malformations are also major etiological factors, like trisomy 13, 18 (Edwards syndrome), and 21 (Down syndrome).

Non-hereditary pediatric cataract often has a cause of either trauma or various systemic diseases. Well-recognised causes include intrauterine infections that are brought about by rubella virus, herpes simplex virus, Toxoplasma gondii, cytomegalovirus, syphilis, and varicella zoster virus. In this regard, regular TORCH screening (toxoplasmosis, rubella, cytomegalovirus, herpes simplex, and others) in pregnant women is necessary to prevent early infection and infection [13,14,15].

- Genetic variation, systemic disease, and infectious factors are usually related to bilateral congenital cataract.
- Even though most of the cataracts in childhood are solitary, a subgroup is related to abnormalities in the eye or the entire body. Some of the common ocular associations are congenital aniridia, microcornea observed in the congenital microcornea-cataract syndrome, microphthalmia, and retained fetal vasculature. Marfan syndrome and Weill-Marchesani syndrome are often systemic.
- Cataract can be gained through ocular trauma, glucocorticoid therapy, and exposure to radiation. Trauma is an important etiological factor.

Study design

The current study was a proposed analytic and cross-sectional study carried out in two major ophthalmic referral centres in Baghdad, Iraq, the Ibn Al-Haitham Teaching Eye Hospital and Ghazi Al-Hariri Hospital of Surgical Specialties, where the two organisations are well-known in their specialised paediatric ophthalmology services and attract a wide range of population in urban and rural areas.

Ethical considerations

The research received ethical as well as scientific approval by the Scientific Committee of the Department of Ophthalmology, which falls under the Iraqi Board of Medical Specialisation. All the participating patients had informed consent in the context of the study, where their legal guardians were informed of the objectives of the research and assurances of confidentiality, which was followed to the latter.

Study population

The population of the study included paediatric patients between one day and 12 years old who attended the research study units mentioned above with a diagnosis of cataract during the period of the study. There were cases where the relevant information was gained through the direct approach, and in such cases, it was through the designated caregivers.

Sampling technique

There was a non-probability consecutive sampling method. All the eligible paediatric patients who came to the study centres with cataract within the study period were recruited until the set sample size.

Exclusion criteria

- Seeing eyes used to be cataracts.
- No full clinical information or no consent.

Data collection

- The structured questionnaire and a complementary clinical data collection form were used to collect the data.
- All data were collected by trained ophthalmology residents, and the data were collected with the assistance of consultant paediatric ophthalmologists.

The protocol of the ocular examination involved age-related visual-acuity tests (e.g., fixation, menace reflex, Cat-ford drum test, Teller acuity cards, finger-counting test, Snellen acuity test, etc.), intraocular pressure, slit-lamp biomicroscopy where possible, and fundus assessment with 90D or 78D lens or by using the binocular indirect ophthalmoscopy with 20D lens. General anaesthesia was done on uncooperative children. B-scan ultrasound was utilised when the lens opacification blocked the assessment of the fundus.

Outcome assessment

The quality of the detailed characterisation of the clinical and demographic presentation of paediatric cataract cases was the definitive outcome measure. These included presentation age, cataract laterality (unilateral or bilateral), cataract type (congenital, developmental, or acquired), seniority between the ages of presentation, consanguinity, and presentation delay.

Statistical analysis

The frequencies and percentages were used to describe categorical variables. The categorical variables were compared through a 2-test with Yates' correction or Fisher's exact test, according to the information situation. The p-value of less than 0.05 was considered to be statistically significant. The statistics, visualisation, and data processing were performed with the help of R software (R version 4.3.0, R Foundation of Statistical Computing, Vienna, Austria).

Results

Table 1: Description of the age categories of the patients with pediatric cataract.

Characteristic	N = 84[1]
Age at presentation	
≤ 6 months	24 (28.6%)
7 months - 1 year	13 (15.5%)
> 1 - 3 years	13 (15.5%)
>3 - 6 years	17 (20.2%)
>6 – 9 years	8 (9.5%)
>9– 12 years	9 (10.7%)
[1]n (%)	

Table** Error! No text of specified style in document..**2: Description of the morphological type of cataract in 138 eyes of 84 patients.

Characteristic	N = 138[1]
Morphological type of cataract	
Nuclear	37 (26.8%)
Mixed	25 (18.1%)
Total	25 (18.1%)
Posterior subcapsular	22 (15.9%)
Lamellar	15 (10.9%)
Anterior polar	5 (3.6%)
Membranous	4 (2.9%)
Posterior polar	4 (2.9%)
Cortical	1 (0.7%)

[1]n (%)

Table 3: Description of the demographic and socioeconomic status of the patients with pediatric cataract stratified by the age at presentation.

Characteristic	Overall, N = 84[1]	≤6 months, N = 24[1]	7 months-1 year, N = 13[1]	> 1-3 years, N = 13[1]	>3-6 years, N = 17[1]	>6-9 years, N = 8[1]	>9-12 years, N=9[1]	p-value[2]
Sex								0.2
Male	44 (52.4%)	15 (62.5%)	7 (53.8%)	9 (69.2%)	6 (35.3%)	2 (25.0%)	5 (55.6%)	
Female	40 (47.6%)	9 (37.5%)	6 (46.2%)	4 (30.8%)	11 (64.7%)	6 (75.0%)	4 (44.4%)	
Residence								0.8
Urban	57 (67.9%)	17 (70.8%)	8 (61.5%)	7 (53.8%)	13 (76.5%)	6 (75.0%)	6 (66.7%)	
Rural	27 (32.1%)	7 (29.2%)	5 (38.5%)	6 (46.2%)	4 (23.5%)	2 (25.0%)	3 (33.3%)	
Father's education								0.2
Illiterate	11 (13.1%)	2 (8.3%)	1 (7.7%)	4 (30.8%)	2 (11.8%)	1 (12.5%)	1 (11.1%)	
Read and write	6 (7.1%)	3 (12.5%)	1 (7.7%)	1 (7.7%)	0 (0.0%)	1 (12.5%)	0 (0.0%)	
Completed primary school	39 (46.4%)	10 (41.7%)	9 (69.2%)	6 (46.2%)	7 (41.2%)	4 (50.0%)	3 (33.3%)	
Completed secondary school	11 (13.1%)	6 (25.0%)	1 (7.7%)	0 (0.0%)	3 (17.6%)	1 (12.5%)	0 (0.0%)	
Higher education	17 (20.2%)	3 (12.5%)	1 (7.7%)	2 (15.4%)	5 (29.4%)	1 (12.5%)	5 (55.6%)	
Mother's education								0.3
Illiterate	15 (17.9%)	4 (16.7%)	1 (7.7%)	3 (23.1%)	4 (23.5%)	2 (25.0%)	1 (11.1%)	
Read and write	12 (14.3%)	2 (8.3%)	2 (15.4%)	2 (15.4%)	2 (11.8%)	1 (12.5%)	3 (33.3%)	
Completed primary school	39 (46.4%)	10 (41.7%)	7 (53.8%)	6 (46.2%)	8 (47.1%)	5 (62.5%)	3 (33.3%)	
Completed secondary school	6 (7.1%)	3 (12.5%)	2 (15.4%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Higher education	12 (14.3%)	5 (20.8%)	1 (7.7%)	1 (7.7%)	3 (17.6%)	0 (0.0%)	2 (22.2%)	
Father's occupation								0.13
Informal Sector Workers	67 (79.8%)	19 (79.2%)	11 (84.6%)	13 (100.0%)	14 (82.4%)	5 (62.5%)	5 (55.6%)	
Formal Sector Employees	16 (19.0%)	5 (20.8%)	2 (15.4%)	0 (0.0%)	3 (17.6%)	3 (37.5%)	3 (33.3%)	
Retired	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (11.1%)	
Mother's occupation								0.7
Housewife	76	22	11	11	16	8	8	

	(90.5%)	(91.7%)	(84.6%)	(84.6%)	(94.1%)	(100.0%)	(88.9%)	
Formal Sector Employees	6 (7.1%)	2 (8.3%)	1 (7.7%)	2 (15.4%)	0 (0.0%)	0 (0.0%)	1 (11.1%)	
Informal Sector Workers	2 (2.4%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	1 (5.9%)	0 (0.0%)	0 (0.0%)	
[1]n (%) [2]Pearson's Chi-squared test; Fisher's exact test								

Table 4: Description of consanguineous marriage and family history of cataract.

Characteristic	**Overall, N = 84[1]**	**≤6 months, N = 24[1]**	**7 months-1 year, N = 13[1]**	**> 1-3 years, N = 13[1]**	**>3-6 years, N = 17[1]**	**>6-9 years, N = 8[1]**	**>9-12 years, N=9[1]**	**p-value[2]**
Presence of consanguineous marriage	58 (69.0%)	18 (75.0%)	8 (61.5%)	11 (84.6%)	13 (76.5%)	4 (50.0%)	4 (44.4%)	0.3
Family history of cataract (N=15)	**15 (17.9%)**	**5 (20.8%)**	**4 (30.8%)**	**4 (30.8%)**	**2 (11.8%)**	**0 (0.0%)**	**0 (0.0%)**	0.2
Father	3 (20.0%)	1 (20.0%)	0 (0.0%)	2 (50.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4
Mother	1 (6.7%)	1 (20.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.9
Siblings	10 (66.7%)	3 (60.0%)	4 (100.0%)	1 (25.0%)	2 (100.0%)	0 (0.0%)	0 (0.0%)	0.2
Distant relatives	2 (13.3%)	0 (0.0%)	0 (0.0%)	2 (50.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.12
[1]n (%) [2]Fisher's exact test								

Table 5: Description of presentation characteristics of pediatric cataract.

Characteristic	**Overall, N = 84[1]**	**≤6 months, N = 24[1]**	**7 months-1 year, N = 13[1]**	**> 1-3 years, N = 13[1]**	**>3-6 years, N = 17[1]**	**>6-9 years, N = 8[1]**	**>9-12 years, N=9[1]**	**p-value[2]**
Who suspected the abnormality?								**0.009**
Caregiver	64 (76.2%)	22 (91.7%)	12 (92.3%)	10 (76.9%)	13 (76.5%)	4 (50.0%)	3 (33.3%)	
Health care professional	17 (20.2%)	2 (8.3%)	1 (7.7%)	3 (23.1%)	3 (17.6%)	3 (37.5%)	5 (55.6%)	
School	2 (2.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	1 (12.5%)	0 (0.0%)	
Patient himself	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (11.1%)	
Referral entity								**0.006**
Ophthalmologist / public hospital	34 (40.5%)	6 (25.0%)	9 (69.2%)	4 (30.8%)	9 (52.9%)	1 (12.5%)	5 (55.6%)	
Ophthalmologist /private sector	32 (38.1%)	14 (58.3%)	2 (15.4%)	6 (46.2%)	4 (23.5%)	4 (50.0%)	2 (22.2%)	
Self-presented	7 (8.3%)	1 (4.2%)	0 (0.0%)	2 (15.4%)	1 (5.9%)	2 (25.0%)	1 (11.1%)	
Pediatrician /	5	2	2	0	1	0	0	

public hospital	(6.0%)	(8.3%)	(15.4%)	(0.0%)	(5.9%)	(0.0%)	(0.0%)	
Primary health care center	3 (3.6%)	1 (4.2%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	0 (0.0%)	1 (11.1%)	
School	2 (2.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	1 (12.5%)	0 (0.0%)	
Internist	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Time between diagnosis and presentation to the hospital								
Less than 1 month	53 (63.1%)	21 (87.5%)	8 (61.5%)	4 (30.8%)	9 (52.9%)	5 (62.5%)	6 (66.7%)	
1-3 months	11 (13.1%)	3 (12.5%)	1 (7.7%)	5 (38.5%)	1 (5.9%)	1 (12.5%)	0 (0.0%)	
4-6 months	10 (11.9%)	0 (0.0%)	4 (30.8%)	3 (23.1%)	2 (11.8%)	1 (12.5%)	0 (0.0%)	
More than 6 months	10 (11.9%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	5 (29.4%)	1 (12.5%)	3 (33.3%)	
[1]n (%) [2]Fisher's exact test								

Table 6: Description of pediatric cataract features stratified by the age at presentation categories.

Characteristic	**Overall, N = 84[1]**	**≤6 months, N = 24[1]**	**7 months-1 year, N = 13[1]**	**> 1-3 years, N = 13[1]**	**>3-6 years, N = 17[1]**	**>6-9 years, N = 8[1]**	**>9-12 years, N=9[1]**	**p-value[2]**
Laterality of the cataract								**0.001**
Bilateral	54 (64.3%)	20 (83.3%)	8 (61.5%)	6 (46.2%)	14 (82.4%)	5 (62.5%)	1 (11.1%)	
Unilateral	30 (35.7%)	4 (16.7%)	5 (38.5%)	7 (53.8%)	3 (17.6%)	3 (37.5%)	8 (88.9%)	
Morphological type of cataract								
Nuclear	19 (22.6%)	12 (50.0%)	2 (15.4%)	1 (7.7%)	4 (23.5%)	0 (0.0%)	0 (0.0%)	
Posterior subcapsular	16 (19.0%)	1 (4.2%)	1 (7.7%)	2 (15.4%)	4 (23.5%)	3 (37.5%)	5 (55.6%)	
Total	16 (19.0%)	2 (8.3%)	5 (38.5%)	3 (23.1%)	2 (11.8%)	1 (12.5%)	3 (33.3%)	
Mixed	15 (17.9%)	4 (16.7%)	3 (23.1%)	3 (23.1%)	2 (11.8%)	3 (37.5%)	0 (0.0%)	
Lamellar	7 (8.3%)	3 (12.5%)	0 (0.0%)	1 (7.7%)	3 (17.6%)	0 (0.0%)	0 (0.0%)	
Anterior polar	3 (3.6%)	1 (4.2%)	0 (0.0%)	1 (7.7%)	1 (5.9%)	0 (0.0%)	0 (0.0%)	
Posterior polar	3 (3.6%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	1 (12.5%)	1 (11.1%)	
Membranous	2 (2.4%)	0 (0.0%)	1 (7.7%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Cortical	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
od lamellar, os	1	1	0 (0.0%)	0	0	0	0	

nuclear	(1.2%)	(4.2%)		(0.0%)	(0.0%)	(0.0%)	(0.0%)	
od total, os lamellar	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	0 (0.0%)	0 (0.0%)	
Presentations of cataract								
Leukocoria	36 (42.9%)	17 (70.8%)	10 (76.9%)	6 (46.2%)	2 (11.8%)	1 (12.5%)	0 (0.0%)	**<0.001**
Strabismus	7 (8.3%)	2 (8.3%)	0 (0.0%)	0 (0.0%)	4 (23.5%)	1 (12.5%)	0 (0.0%)	0.2
Nystagmus	1 (1.2%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.3
Poor vision	25 (29.8%)	2 (8.3%)	3 (23.1%)	2 (15.4%)	10 (58.8%)	5 (62.5%)	3 (33.3%)	**0.002**
Photophobia	7 (8.3%)	2 (8.3%)	0 (0.0%)	1 (7.7%)	2 (11.8%)	1 (12.5%)	1 (11.1%)	0.9
Other	13 (15.5%)	2 (8.3%)	1 (7.7%)	2 (15.4%)	2 (11.8%)	1 (12.5%)	5 (55.6%)	0.055

[1]n (%)
[2]Fisher's exact test; Pearson's Chi-squared test
PHPV: Persistent Hyperplastic Primary Vitreous

Table 7: Description of the past medical, surgical, and drug history stratified by the age at presentation.

Characteristic	**Overall, N = 84[1]**	**≤6 months, N = 24[1]**	**7 months-1 year, N = 13[1]**	**> 1-3 years, N = 13[1]**	**>3-6 years, N = 17[1]**	**>6-9 years, N = 8[1]**	**>9-12 years, N=9[1]**	**p-value[2]**
History of trauma	14 (16.7%)	0 (0.0%)	1 (7.7%)	4 (30.8%)	2 (11.8%)	1 (12.5%)	6 (66.7%)	**<0.001**
Use of systemic medications	6 (7.1%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	2 (11.8%)	3 (37.5%)	0 (0.0%)	**0.011**
Steroids	3 (3.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	2 (25.0%)	0 (0.0%)	
Growth hormone	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	0 (0.0%)	0 (0.0%)	
Insulin	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (12.5%)	0 (0.0%)	
Thyroxin	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Presence of a congenital ocular abnormality	17 (20.2%)	5 (20.8%)	4 (30.8%)	3 (23.1%)	0 (0.0%)	2 (25.0%)	3 (33.3%)	0.14
PFV	5 (6.0%)	3 (12.5%)	2 (15.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
High myopia	3 (3.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (12.5%)	2 (22.2%)	
Congenital glaucoma	2 (2.4%)	0 (0.0%)	0 (0.0%)	2 (15.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Microphthalmia	2 (2.4%)	1 (4.2%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Microcornea	1 (1.2%)	1 (4.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Microphthalmia, microcornea,	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (12.5%)	0 (0.0%)	

uveal coloboma								
ROP	1 (1.2%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Uveal coloboma	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Presence of congenital systemic abnormality (N=10)	10 (11.9%)	1 (4.2%)	3 (23.1%)	3 (23.1%)	1 (5.9%)	2 (25.0%)	0 (0.0%)	0.14
ASD and microcephaly	1 (1.2%)	1 (4.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Asthma	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
CP, and CHD	1 (1.2%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
CHD	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Dermatitis	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (12.5%)	0 (0.0%)	
Diabetes	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (12.5%)	0 (0.0%)	
Growth hormone deficiency	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	0 (0.0%)	0 (0.0%)	
Hypocalcemia	1 (1.2%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Hypothyroidism	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Thyroid dysfunction and neonatal jaundice	1 (1.2%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Syndromes associated with congenital cataract								0.4
Down syndrome	3 (3.6%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	1 (5.9%)	0 (0.0%)	1 (11.1%)	
History of TORCHS infections (N=16)	16 (19.0%)	10 (41.7%)	2 (15.4%)	1 (7.7%)	2 (11.8%)	1 (12.5%)	0 (0.0%)	**0.055**
Cytomegalovirus	9 (10.7%)	7 (29.2%)	1 (7.7%)	0 (0.0%)	1 (5.9%)	0 (0.0%)	0 (0.0%)	
Rubella	3 (3.6%)	1 (4.2%)	1 (7.7%)	0 (0.0%)	1 (5.9%)	0 (0.0%)	0 (0.0%)	
Toxoplasmosis	3 (3.6%)	1 (4.2%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	1 (12.5%)	0 (0.0%)	
Rubella and Cytomegalovirus	1 (1.2%)	1 (4.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

[1]n (%)
[2]Fisher's exact test

Table 8: Association between gender and cataract clinical parameters.

Characteristic	Female, N = 40[1]	Male, N = 44[1]	P-value[2]

Consanguineous marriage	29 (72.5%)	29 (65.9%)	0.5
Family history of cataract	6 (15.0%)	9 (20.5%)	0.5
History of trauma	6 (15.0%)	8 (18.2%)	0.7
Presence of a congenital ocular abnormality	8 (20.0%)	9 (20.5%)	>0.9
Presence of a congenital systemic abnormality	6 (15.0%)	4 (9.1%)	0.5
History of TORCHS infections	8 (20.0%)	8 (18.2%)	0.8
Who suspected the abnormality?			0.2
Caregiver	32 (80.0%)	32 (72.7%)	
Health care professional	6 (15.0%)	11 (25.0%)	
School	2 (5.0%)	0 (0.0%)	
Patient himself	0 (0.0%)	1 (2.3%)	
Time between diagnosis and presentation to the hospital			0.4
Less than 1 month	27 (67.5%)	26 (59.1%)	
1-3 months	3 (7.5%)	8 (18.2%)	
4-6 months	4 (10.0%)	6 (13.6%)	
More than 6 months	6 (15.0%)	4 (9.1%)	
Laterality of the cataract			0.4
Bilateral	24 (60.0%)	30 (68.2%)	
Unilateral	16 (40.0%)	14 (31.8%)	
Morphological type of cataract			0.067
Nuclear	11 (27.5%)	8 (18.2%)	
Posterior subcapsular	8 (20.0%)	8 (18.2%)	
Total	3 (7.5%)	13 (29.5%)	
Mixed	11 (27.5%)	4 (9.1%)	
Lamellar	2 (5.0%)	5 (11.4%)	
Anterior polar	2 (5.0%)	1 (2.3%)	
Posterior polar	1 (2.5%)	2 (4.5%)	
Membranous	1 (2.5%)	1 (2.3%)	
Cortical	0 (0.0%)	1 (2.3%)	
od lamellar, os nuclear	0 (0.0%)	1 (2.3%)	
od total, os lamellar	1 (2.5%)	0 (0.0%)	
Presentation of cataract			
Leukocoria	12 (30.0%)	24 (54.5%)	**0.023**
Strabismus	6 (15.0%)	1 (2.3%)	0.050
Nystagmus	0 (0.0%)	1 (2.3%)	>0.9
Poor vision	17 (42.5%)	8 (18.2%)	**0.015**
Photophobia	4 (10.0%)	3 (6.8%)	0.7
Other	5 (12.5%)	8 (18.2%)	0.5
[1]n (%) [2]Pearson's Chi-squared test; Fisher's exact test			

Discussion

Our current study shows that most of the pediatric cataracts were diagnosed by the caregivers, especially in children below the age of six months. Similar results are highlighted by Ahmad et al., who state that it is more practicable when there is a good awareness of the caregivers, particularly in cases acquired at birth that present with symptoms like leukocoria [16].

Regarding age, 28.6 0 part of children were presented within the first six months of life. This finding concurs with the literature of Almon et al., asserting that the early presentation is significant in visual prognosis, particularly where surgery is undertaken at the delicate stage of the visual development period [17].

Regarding morphology, our cohort was majorly represented by nuclear cataracts, and then mixed and total. The distribution is similar to that which was reported worldwide, as shown by Long et al., who reported polar, mixed, and total cataracts as the most frequent manifestation in their Chinese sample of the disease [18]. In contrast, another study carried out by Alajami et al. in Egypt found the most morphological types to be total cataract (30.3% 100) and anterior polar cataract (15.1% 100). [19]

In a different study, 79.4 per cent of patients with non-syndromic cataract in paediatrics had the consanguinity of parents, as reported by Khitam et al. in Baghdad [20,21]. This is significantly greater than the European cohort rate, which records less consanguinity. On the other hand, studies conducted in Western societies, including Bell et al., observe that although genetics is an additional factor, consanguinity is a much rarer factor since the norms in the societies differ significantly [22,23].

In our cohort, the positive family history occurred in 17.9% of pediatric cataracts, and it was mainly parent-to-parent. In Saudi Arabia, Aldahmesh et al. determined that in at least 79% of the families studied, pediatric cataract was found to be genetic and thus concluded that it is an autosomal recessive disease in nature. [24].

Various recent works reflect this age-based presentation timing trend. According to a multi-center study in the UK, Rahi et al. found that early diagnosis was highly prevalent among the younger children, particularly those who were below the age of two years, since there was already a developed screening of the neonatal and close parental monitoring. However, in older children, diagnostic delays were frequent because they start being harder to detect or they are confounded with refractive errors or behavioural problems [25].

In like manner, Huang et al. also discovered that the latency to referral was significantly longer among older children in the U.S., and symptoms were less apt to provoke prompt ophthalmologic care. They also highlighted the effect of the first source of referral, such that individuals referred by paediatricians were more likely to get seen early than those that were referred through school screenings or self-presentation [26].

One of the outstanding aspects of our study was the high rate of bilateral cataracts in newborns and a shift to unilateral cases as age progresses, as it is also observed in the rest of the world. Similar age-related differences in laterality were reported by Bell et al. in a large clinical review, and it was observed that the bilateral forms need early diagnosis because of the presence of visible features like leukocoria [27].

Morphologically, the fact that most of the nuclear cataracts occur in younger infants is also an indication of a congenital etiology. This is contradicted by the results of Aldahmesh et al., where they establish that the etiology of the majority of cases of congenital cataract is genetic [28].

Leukocoria is a characteristic symptom in young children, and it must be considered sooner by the caregiver. Sen et al. also describe this age-related change in symptoms, and point out that, though leukocoria causes referral to care earlier, subjective complaints about poor vision are more dominant in the presentations of older children because caregivers are less effective at detecting it [29].

Pediatric cataracts etiology has significant age-related patterns, which can be supported by the cohort as well as by the world literature. This trend is comparable to the results of Nihalani and VanderVeen, who noted that children of older age tend to show cases of unilateral traumatic cataracts, which can be rather often due to blunt injuries in the eye during play or sports activity [30].

In data also, steroid-induced cataracts had an age effect, or at least in children, the most prevalent age was 7-9 years. This is in line with previous studies by Bell et al., who found out that the most pervasive type of cataracts associated with the use of systemic corticosteroids was the posterior subcapsular cataracts. Exposure to steroids in children with asthma, autoimmune, or endocrine disorders is identified as a known risk factor [31].

Some congenital optical defects, like Persistent Fetal Vasculature (PFV), were also significantly prevalent among babies, especially below one year. The significance of a comprehensive anterior and posterior segment evaluation of the infant was further reinforced by the observation by Almon that structural abnormalities of the eye are frequently present in combination with congenital cataracts [32].

Congenital systemic was also seen in 11.9% of cases, and this ranged between congenital heart disease and cerebral palsy. These findings are also supported by Gerrie et al., who observe that paediatric cataracts may be included in the multisystem syndromes of KlippelTrénaunay and Down syndrome, but these syndromic relationships appear infrequent in general. [33] [34].

Conclusion

Pediatric cataracts in Iraq are also congenital and are mostly bilateral and closely associated with consanguineous marriages; leukocoria is a common manifestation of the disorder. On the other hand, cases of unilateral cataracts are common in older children, mostly after either trauma or steroids, and the consequent delay in identification is likely to deteriorate the outcome of the eye disorders.

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