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# The pattern of childhood eye diseases at a tertiary hospital in Akure, South-Western Nigeria

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## Abstract

**Purpose:** Good visual health is important in children for healthy growth and good educational performance. Ocular diseases are regular causes of hospital consultations with varying types of diseases in different localities. This study aimed to determine the pattern of childhood eye diseases and provide baseline data in our hospital.

**Methods:** This is a retrospective review of all patients aged between 0 and 17 years old who presented to the eye clinic of our hospital to our clinic between January 2021 and December 2022. Diagnoses were made by the consultants and follow-up of the patients was done by the ophthalmology residents. Data on age at presentation, sex, and diagnosis were collected and analyzed using SPSS.  $P < 0.05$  was considered statistically significant.

**Results:** A total of 639 pediatric cases presented to the clinic during the study period with a male-to-female ratio of 1:1.1. This represents 24.62% of all the cases (adults and children) that presented to the eye clinic within the study period. Children aged 11–17 years made up the largest group ( $p = 0.013$ ). Refractive errors (37.9%), allergic and vernal conjunctivitis (32.7%), ocular trauma (7.0%), and infective conjunctivitis (3.8%) were the most common conditions. Refractive error was more common in females ( $p = 0.002$ ).

**Conclusion:** The knowledge of common childhood diseases can aid planning, allocation of resources and increase awareness to prevent these potentially blinding conditions.

**Keywords:** Allergic conjunctivitis; children; ocular trauma; pattern; refractive errors.

The most dominant of our senses is vision. The role it plays in every aspect of our existence is very critical. The absence of vision makes the ability to walk, to learn and read at school, and function well at work a herculean task. Sadly, vision is often taken for granted.<sup>[1]</sup> This is particularly important in children as the affectation of their vision will

impact negatively on all aspects of their development. Any delay in the treatment of eye diseases can lead to visual impairment or permanent blindness.<sup>[2]</sup>

The economic status of the parents and geographical locations are factors that could influence ocular morbidity in children.<sup>[3]</sup> The pattern of eye disease in the middle-income



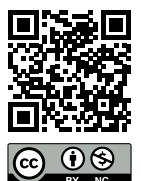
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regions is glaucoma, retinopathy of prematurity, and congenital cataract while their industrialized counterparts have congenital anomalies, inherited eye diseases, and retinal disorders, and diseases of the central nervous system have common causes of childhood eye diseases.<sup>[4,5]</sup> Other developed countries of the world and Israel have inherited eye diseases as the commonest cause of blindness and visual impairment.<sup>[4,5]</sup> The major causes of ocular disorders reported in developing countries are conjunctivitis, ocular trauma, refractive error, and infections of the eye and its adnexa and trachoma.<sup>[6,7]</sup>

This study aimed to determine the pattern of childhood eye diseases seen at a tertiary hospital in South-western Nigeria. It will also provide baseline data that can serve as a useful template for advocacy toward planning interventional measures to reduce common childhood eye disorders within the community and its environs. These findings will also be useful in serving as a baseline for the development of a pediatric ophthalmology subspecialty in the tertiary hospital.

## Materials and Methods

The eye clinic of our hospital serves as a referral center for the communities along with the neighboring communities. This is a retrospective, cross-sectional study of children aged 17 years and below who visited the eye clinic for the first time from January 2021 to December 2022 was conducted. Case notes were retrieved and reviewed. Fifty-six children who presented for a medical check-up and had no eye disorders were excluded from the study. At the first visit, all patients had a full ophthalmic evaluation carried out by a consultant ophthalmologist. Tests were conducted to elicit a diagnosis, and management commenced as required. Subsequently, patients were seen by resident ophthalmologists under the supervision of the consultants. Consultations with pediatricians and other specialists were made when necessary. Information obtained was age at presentation, sex, and clinical diagnosis. The clinical diagnosis was grouped as appropriate. Patients were grouped by age into a preschool (0–5 years), school-age (6–10 years), or older children (11–17 years) group.

Ethical approval was obtained on January 24<sup>th</sup>, 2025. The protocol number is OSHREC/24/01/2025/802. The study was conducted in accordance with the Declaration of Helsinki.

Statistical Analysis: Data were stored and analyzed using the Statistical Package of the Social Sciences Statistics version 21 software produced by IBM Corp. in Armonk, New York, United States of America. Data are presented as simple

frequencies and cross-tabulations. A Chi-squared test was used to compare variables and  $p < 0.05$  was considered statistically significant.

## Results

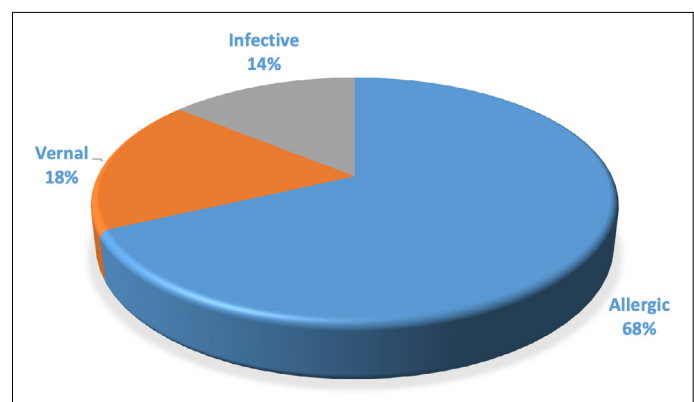
A total number of 639 records of pediatric cases who were seen in the eye clinic during the study period were reviewed. This makes up 24.62% of all the new patients seen. There were 307 (48.0%) males and 332 (52%) females with a male-to-female ratio (M:F) of 1:1.1. The 11–17 years group had the highest frequency of consultation, constituting 46.3% of the patients ( $p = 0.004$ ). The 11–17 years age group had the highest subjects, with more males in the 0–5 and 6–10 years groups and more females in the 11–17 years group, in an association that was statistically significant,  $p = 0.001$  (Table 1).

The distribution of the conditions showed the highest being refractive error 242 (37.9%), followed by allergic conjunctivitis 209 (32.7%). Allergic and vernal conjunctivitis were grouped together as allergic conjunctivitis (Fig. 1).

In the 0–5-year-old group, nasolacrimal duct obstruction (NLDO), strabismus, infective conjunctivitis, and keratitis were prominent; space-occupying lesions and chorioretinitis were common among the 6–10-year-old age group, while refractive error, retinal detachment, and uveitis were prevalent in the 11–17-year-old age group (Table 2).

**Table 1.** Age and sex distribution of children

Gender	Age group in years			Total (%)
	0–5 years (%)	6–10 years (%)	11–17 years (%)	
Male	89 (29.0)	100 (32.6)	118 (38.4)	307 (48.0)
Female	71 (21.4)	83 (25.0)	178 (53.6)	332 (52.0)
Total	160 (25.0)	183 (28.7)	296 (46.3)	639 (100.0)



**Fig. 1.** The types of conjunctivitis.

**Table 2.** Distribution of childhood eye disorders across groups

Diagnosis	Age group			Total (%)
	0–5 (%)	6–10 (%)	11–17 (%)	
Refractive error	16 (6.6)	71 (29.4)	155 (64.0)	242 (37.9)
Glaucoma	4 (26.7)	5 (33.3)	6 (40.0)	15 (2.3)
Cataract	4 (25.0)	4 (25.0)	8 (50.0)	16 (2.5)
Allergy conjunctivitis	65 (31.1)	63 (30.1)	81 (38.8)	209 (32.7)
Keratitis	7 (46.6)	4 (26.7)	4 (26.7)	15 (2.3)
Ocular trauma	14 (31.1)	16 (35.6)	15 (33.3)	45 (7.0)
Infective conjunctivitis	13 (54.2)	8 (33.3)	3 (12.5)	24 (3.8)
Retinal detachment	0 (0)	0 (0)	1 (100)	1 (0.2)
Chorioretinitis	0 (0)	1 (50)	1 (50)	2 (0.3)
Space-occupying lesion	1 (25.0)	2 (50.0)	1 (25.0)	4 (0.6)
Chalazion	4 (28.6)	5 (35.7)	5 (35.7)	14 (2.2)
Uveitis	1 (20.0)	0 (0)	4 (80.0)	5 (0.8)
Blepharitis	4 (57.1)	1 (14.3)	2 (28.6)	7 (1.1)
Strabismus	5 (83.3)	0 (0)	1 (16.7)	6 (0.9)
Nasolacrimal duct obstruction	11 (84.6)	0 (0)	2 (15.4)	13 (2.0)
Others	11 (52.4)	3 (14.3)	7 (33.3)	21 (3.3)
Total	160 (25.0)	183 (28.7)	296 (46.3)	639 (100.0)

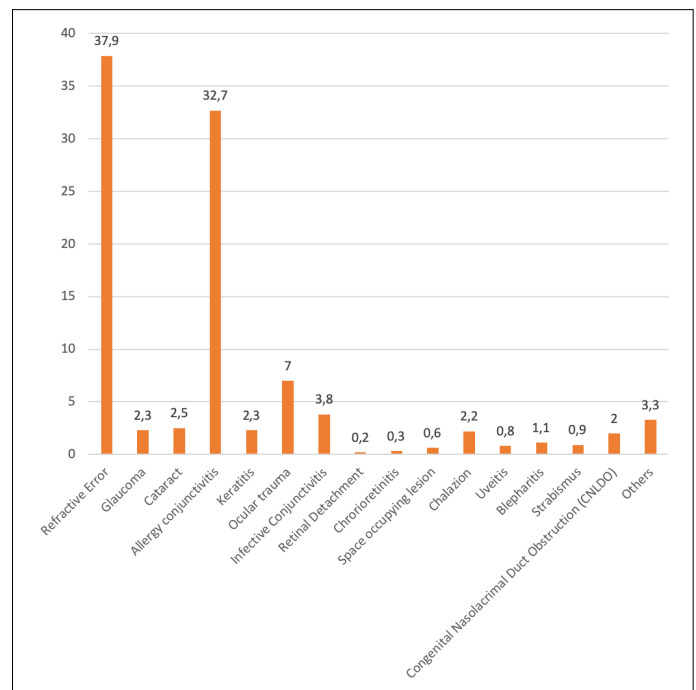
Certain diseases were more common in a particular gender and age group as shown in Table 3,  $p=0.000$ . There were more females with refractive error across all the age groups with the highest subjects in the 11–17 age group (60.1%). Ocular trauma was more common among the male children (25%) and was recorded more in the 6–10 age group. Cataract was more prevalent in males among the 11–17 age group (4.2%).

All types of conjunctivitis, infective and allergic/vernal conjunctivitis, occurred more in males than in females. Infective conjunctivitis was more prevalent in the 0–5 age group, while allergic conjunctivitis was recorded more in the 11–17 age group. Figure 2 shows the types of conjunctivitis.

## Discussion

The early diagnosis and prompt management of childhood eye disorders is key to the proper development of children, as otherwise it may lead to visual impairment or childhood blindness. This will impact negatively on the number of blind years for the child. The pattern of eye disorders in children has been found to vary along various geographical locations and is also different from the causes of blindness in adults.

There was a higher frequency of consultation among the older children, with a female preponderance in this study. The reason may be as previously reported that this age

**Fig. 2.** The distribution of childhood eye disorders.

group is older, they are better able to express themselves, and the chronic nature of the disease.<sup>[7,8]</sup> The higher number of females in this study agrees with studies in Osogbo,<sup>[8]</sup> Port-Harcourt<sup>[9]</sup> in Nigeria, and Jeddah in Saudi Arabia,<sup>[10]</sup> though it is at variance with other hospital based studies in western India<sup>[11]</sup> Nigeria<sup>[12]</sup> and Nepal<sup>[13]</sup> where their frequency of consultation was higher in males.

**Table 3.** Distribution of childhood eye disorders across age group and gender

Gender diagnosis	Age group			Total (%)
	0–5 years (%)	6–10 years (%)	11–17 years (%)	
Male refractive error	6 (6.7)	35 (35)	48 (40.7)	89 (29)
Glaucoma	2 (2.2)	2 (2.0)	1 (0.8)	5 (1.6)
Cataract	1 (1.1)	3 (3.0)	5 (4.2)	9 (2.9)
Allergy conjunctivitis	39 (43.8)	34 (34.0)	42 (35.6)	115 (37.5)
Keratitis	3 (3.4)	2 (2.0)	3 (2.5)	8 (2.6)
Ocular trauma	6 (6.7)	10 (10.0)	9 (7.6)	25 (8.1)
Infective conjunctivitis	8 (9.0)	6 (6.0)	2 (1.7)	16 (5.2)
Retinal detachment	0 (0)	0 (0)	1 (0.8)	1 (0.3)
Chorioretinitis	0 (0)	1 (1.0)	0 (0)	1 (0.3)
Space-occupying lesion	1 (1.1)	2 (2.0)	1 (0.8)	4 (1.3)
Chalazion	2 (2.2)	3 (3.0)	1 (0.8)	6 (2.0)
Uveitis	1 (1.1)	2 (2.0)	2 (1.7)	3 (1.0)
Blepharitis	2 (2.2)	0 (0)	0 (0)	2 (0.7)
Strabismus	4 (4.5)	0 (0)	0 (0)	4 (1.3)
Nasolacrimal duct obstruction	4 (4.5)	0 (0)	1 (0.8)	5 (1.6)
Others	10 (11.2)	2 (2.0)	2 (1.7)	14 (4.6)
Total	89	100	118	307 (100)
Female refractive error	10 (14.1)	36 (43.4)	107 (60.1)	153 (46.1)
Glaucoma	2 (2.8)	3 (3.6)	5 (2.8)	10 (3.0)
Cataract	3 (4.2)	1 (1.2)	3 (1.7)	7 (2.1)
Allergy conjunctivitis	26 (36.6)	29 (34.9)	39 (21.9)	94 (28.3)
Keratitis	4 (5.6)	2 (2.4)	1 (0.6)	7 (2.1)
Ocular trauma	8 (11.3)	6 (7.2)	6 (3.4)	20 (6.0)
Infective conjunctivitis	5 (7.0)	2 (2.4)	1 (0.6)	8 (2.4)
Chorioretinitis	0 (0)	0 (0)	1 (0.6)	1 (0.3)
Chalazion	2 (2.8)	2 (2.4)	4 (2.2)	8 (2.4)
Uveitis	0 (0)	0 (0)	2 (1.1)	2 (0.6)
Blepharitis	2 (2.8)	1 (1.2)	2 (1.1)	5 (1.5)
Strabismus	1 (1.4)	0 (0)	1 (0.6)	2 (0.6)
Nasolacrimal duct obstruction	7 (9.9)	0 (0)	1 (0.6)	8 (2.4)
Others	1 (1.4)	1 (1.2)	5 (2.8)	7 (2.1)
Total	71	83	178	332 (100)

The difference could be due to the differences in the demographic patterns in these places.

About one-third of the pediatric cases seen in our clinic over a 2-year period were diagnosed with refractive error, with the highest frequency in the 11–17 year age group. This is similar to studies in Port Harcourt<sup>[9]</sup> and Ibadan<sup>[12]</sup> in Nigeria, Jeddah in Saudi Arabia<sup>[10]</sup> and Odisha in India,<sup>[14]</sup> which also reported that a third of their pediatric cases had refractive error. Several studies in Nigeria<sup>[15-19]</sup> and in other parts of the world<sup>[10, 11, 14]</sup> also reported refractive error as the most common ocular disorder. However, this is different from other reports in which refractive error was second<sup>[3,20]</sup> or fourth<sup>[8]</sup> most common disorder reported.

The female preponderance in the occurrence of refractive error is similar to previous reports in Nigeria<sup>[7,15]</sup> and in Nepal.<sup>[21]</sup> This is in keeping with the observation that females tend to report vision challenges more than males<sup>[7]</sup> and that earlier developmental changes that occur in females may explain this observation,<sup>[22]</sup> while Lou et al.<sup>[23]</sup> observed that the female gender is associated with higher significance of refractive error. The majority of the refractive error children were in the 11–17 age group. Previous studies<sup>[6,20,24]</sup> also reported a higher incidence in older children. It has been suggested that it may be due to changes in the refractive state of the eye that is expected as we grow older.<sup>[12]</sup> Refractive error is one of the common causes of visual impairment and blindness globally.<sup>[11]</sup> Unfortunately, children are more adversely affected as

uncorrected refractive error can lead to amblyopia and subsequent needless blindness. For children to benefit from proper health services, there needs to be a synergy that will facilitate a seamless referral system between health and educational institutions.<sup>[10]</sup> School eye health services need to be developed, and where available, need to be strengthened to regularly screen for refractive errors and refer affected children appropriately for refractive services. This will assist in preventing poor school performance and the development of amblyopia, which are the sequelae of uncorrected refractive error. The myth that prescription eyeglasses use in children further damage to the eyes must be changed through awareness and health education campaigns. This is to ensure early presentation, with the hope of strengthening and improving the use of existing refractive services.<sup>[7]</sup>

Allergic conjunctivitis is the second most common ocular disorder found in this study. This is similar to findings by Adio in Porthacourt,<sup>[9]</sup> Ajaiyeoba in Ibadan,<sup>[25]</sup> and Abah<sup>[17]</sup> in Zaria, Nigeria. However, several studies have reported allergic conjunctivitis as the most common ocular disorder.<sup>[3,8,19]</sup>

Among the types of conjunctivitis in this study, the allergic type was more common than infective conjunctivitis, which is similar to findings in other studies.<sup>[8,19]</sup> The farming communities with a dry and dusty environment may be a contributing factor.<sup>[3,7]</sup> Allergic conjunctivitis is a chronic disease. It causes a lot of discomfort and has a high rate of recurrence. This frequent recurrence and severity of the symptoms increase the chances of having impaired vision. This can be a factor in absenteeism from school.<sup>[15,17]</sup> Early detection and proper treatment are therefore of utmost importance to prevent fatal blinding complications and absenteeism from school. This is greatly important so that education will not be negatively affected.<sup>[7,8]</sup>

Ocular traumas are preventable but a complicated cause of blindness. The number of blind years involved makes it extremely severe in children. The third most common childhood ocular morbidity in our study is ocular trauma. This is in agreement with previous reports.<sup>[3,6,14,15]</sup> but at variance with Onakpoya and Adeoye.<sup>[6]</sup> in which ocular trauma was the most common ocular morbidity. The cause of the high prevalence of ocular injury in the study<sup>[7]</sup> was not clear; they opined that it may be due to the largely agricultural environment of the study. Injuries may occur to the children during farming activities. There was a higher incidence among the school-age group in our study, which is like previous studies.<sup>[7,25]</sup> The male preponderance

described here has also been previously reported.<sup>[7,10]</sup> Childhood eye injuries occur more in males and the school-age group, probably due to their being largely in their exploratory years. They tend to be more adventurous and playful, especially when not supervised. Prevention remains the only way to the reduction of this ocular morbidity, which can be very challenging to manage.<sup>[25]</sup>

Other causes of childhood ocular morbidity found in this study include keratitis, NLDO, glaucoma, cataract, retinal detachment, chorioretinitis, space-occupying lesion, and strabismus. These have also been reported by several other studies.<sup>[7,8,11,12]</sup>

This study is being aimed to establish a baseline for our center and it will also be a relevant guide in the establishment of pediatric ophthalmology subspecialty.

### Limitation

The study is a hospital-based study and it is retrospective. There may have been cases that have not presented in the hospital for treatment, and so are not reflected in this study. Moreover, there may have been a loss of some data because it is a retrospective study.

### Conclusion

The most common causes of childhood ocular morbidity in this study were refractive error and allergic conjunctivitis. These are causes of avoidable visual impairment and blindness with the negative sequelae on the education and socioeconomic life of the affected child. Refractive error and allergic conjunctivitis account for about 70% of the pediatric patients presenting to the ophthalmology clinic of the hospital within the study period. There is an urgent need for relevant and effective interventional measures. These include screening programs in the communities to reduce the burden of ocular diseases through early detection, establishment of effective school eye health, incorporation of basic eye health into the primary health care, and public enlightenment on the importance of children's eye health, especially among the parents and the populace.

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**Ethics Committee Approval:** The Ondo State ministry of Health Ethics Committee granted approval for this study (Date 24/01/2025, number OSHREC/24/01/2025/802).

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