Clinical Profile of Ocular Diseases Among Pediatric Patients Attending a Tertiary Care Hospital in South India

Prasanthi Musunuru[1], Ravikumar Rangasamy[1], Karthikeyan Mahalingam[2], Abirami Selvaganapathy[3]

[1] Department of Ophthalmology, Tagore Medical College and Hospital, Tamil Nadu, India, [2] Department of Ophthalmology, JIPMER, Puducherry, India, [3] Department of Pediatrics, Madras Medical College, Tamil Nadu, India

Abstract

Background: Eye diseases in children are an important cause of medical (visual) disability and require prompt attention because of their impact on the child's development, education, future work and quality of life. Although most ocular lesions are preventable/treatable, due to ignorance and inability to detect them in early stages, they cause impairment of vision or even blindness.

Objectives:

1. To determine the clinical pattern of Ocular diseases among Pediatric Age group patients attending Ophthalmology outpatient services of the tertiary care Hospital.
2. To enumerate the causes of Amblyopia and describe the treatment outcome among the study participants.

Materials and methods: This study was conducted among children aged between 0-18 years attending ophthalmology outpatient services during the study period (n=803). The participants were screened for various ophthalmic conditions and those diagnosed to have amblyopia were treated and followed up for up to six months to check for the visual outcome.

Results: The most common ocular condition among the participants was refractive error (25.9%), followed by Conjunctival diseases (17.2%). The prevalence of amblyopia was 7%, with Isometric amblyopia being the most common type of amblyopia (42%). The treatment outcome was better among those aged between 5-8 years compared to other age groups.

Conclusion: Refractive error was the common ocular morbidity in children and uncorrected refractive error was the most common cause of amblyopia.

Keywords: Ocular diseases, Amblyopia, Refractive error.

INTRODUCTION

Eye diseases in children are an important cause of medical (visual) disability and require prompt attention because of their impact on the child's development, education, future work and quality of life. Although most ocular lesions are preventable/treatable, due to ignorance and inability to detect them in early stages, they cause impairment of vision or even blindness.[1] Childhood blindness is a priority area because of the number of years of blindness that ensues.[2] In general, infections and malnutrition are the common causes of visual impairment in children in developing countries whereas optic nerve lesions and retinal disorders are the main causes in developed countries.[3]

Common causes of visual impairment in childhood are uncorrected refractive error and cataract.[4,5] Delayed treatment in the conditions like uncorrected refractive error, cataract, strabismus or corneal opacity can lead to ambylopia. So timely treatment in childhood ocular diseases is of prime importance to reverse the vision loss. Amblyopia is an eye condition defined with diminished unilateral or bilateral visual acuity due to deprived visual pattern or abnormal binocular interaction.[6] Reduced stereopsis is the most common visual deficit associated with amblyopia that is present under habitual binocular viewing.[7] The treatment of amblyopia in children is most crucial as its highly effective and successful in gaining vision when intervened early, there is marked difference in the treatment outcome after the age of 10 years, this emphasize on early identification and management.[8–13]

***Corresponding author:**
Prasanthi Musunuru, Associate Professor, Department of Ophthalmology, Tagore Medical College and Hospital, Tamil Nadu, India
E-mail: drshanthi752@yahoo.com

Knowledge of patterns of eye diseases in children provides useful baseline data for planning child eye care services in a given region or the whole of a country. Understanding the specific causes of visual reduction also helps in proper and efficient allocation and investment of resources for preventive and control measures as well as treatment of childhood eye diseases. Furthermore, it helps to prioritize and use resources proficiently where scarcity of resources is a concern.[3] This study planned to determine the clinical pattern of pediatric ocular diseases in a tertiary care hospital in south India. In addition, causes and short term treatment outcomes of ambylopia were also assessed.

MATERIALS AND METHODS

This study was conducted at Ophthalmology department of a Tertiary care hospital in South India. Institutional Ethics Committee approval was obtained. This study adhered to the tenets of Declaration of Helsinki. Written informed consent was obtained from the guardian of each participant for the study. The pediatric patients aged between 0-18 years, with ophthalmic complaints attending the Ophthalmology outpatient services between 1st January 2022 to 31st May 2023 willing to participate and/or consented by the parents to take part in the study were included.

A detailed history was noted down including chief complaints, history of presenting illness, antenatal, natal, postnatal history, family and personal history.

Visual acuity was checked using Binocular fixation or preference and fixation target or Central Steady Maintained (CSM) method (in infants); Bock's candy bead test (in 1 to 2 years); Kay pictures or Cardiff acuity tests or Tumbling E-chart (in pre-school children); and Snellen's chart (Auto Chart Projector Model – ACP7E, Topcon Corp., Tokyo Japan) (in older children) according to the age. Refraction was performed when required under cycloplegia with cyclopentolate 1% eye drops (Instadyle TM, Cornea Care, India) 2-3 times with 10-15 minutes intervals. Anterior segment examination was done with torch, slit lamp bio microscope (Haag Streit model BQ AT 900 7.2 980 Switzerland). Fundus examination was done using indirect ophthalmoscope with +20D (Double Aspheric Volk Lens, Volk Optical Inc., OH, USA) / Slit lamp biomicroscopy with +90D (Double Aspheric Volk Lens, Volk Optical Inc., OH, USA) lens. B scan Ultrasonography was done with (E-Z scan AB5500+) ophthalmic ultrasound scanner. NIDEK paediatric hand held Autorefractometer/ Keratometer was used.

Intra Ocular pressure was checked with Gold man applanation tonometry or non contact tonometer (Top Con TRK-1P) or tonopen (Reichert XL). Squint assessment was done in detail using prisms and tests for stereopsis.

After evaluation necessary treatment was given to the patient in the form of glasses, medical management or surgical management. If a patient has more than one ocular condition, only the primary disease was taken for diagnosis.[14]

Ambylopia was diagnosed when the visual acuity is less than 6/12 in one or both eyes with no other ocular pathology contributing to vision loss. Children less than 2 years or in whom snellens equivalent vision conversion was not possible were excluded from diagnosis of ambylopia. Ambylopia was categorised as isometropic (hyperopia> 4.5DS, myopia> 6DS, astigmatism>1.5DS), anisometropic (hyperopia> 1DS, myopia> 2.5DS, astigmatism>1.5DS), strabismic (presence of heterophoria in absence of anisometropia meeting criteria for ambylopia), stimulus deprivational ambylopia (conditions obstructing the central visual axis) or mixed ambylopia (more than one mechanism of ambylopia involved).[13,15]

After adequate refractive correction (refractive ambylopia), squint surgery (strabismic ambylopia) or cataract surgery (vision deprivation ambylopia); patching was advised and patients were followed up to 6 months to assess treatment outcomes.

Outcome after amblyopia treatment was assessed after 6 months and graded as

(a) Good: Improvement in visual acuity two lines or more

(b) Satisfactory: one line improvement in visual acuity

(c) Poor: No improvement

The data was recorded in the standard proforma and analyzed. Data on age, sex, final diagnosis and treatment were collected and analyzed using SPSS version 18 (SPSS Inc., Chicago, IL, USA.

RESULTS

Out of 840 pediatric patients, 803 of the patients fulfilling the study criteria were included in the study. The sociodemographic details of participants are mentioned in Table 1. Refractive error (n=208, 25.9%) was the most

common disease followed by conjunctival diseases (like allergic and infective conjunctivitis) (n=138, 17.2%) (table 2).

A total of 55 patients out of 803 patients were found to have amblyopia (Patients less than 2 years or in whom snellens equivalent vision conversion was not possible were excluded from diagnosis of ambylopia, n=102). Refractive type of amblyopia is the common one which includes isometropic and anisometropic amblyopia (Table 3). Uncorrected refractive errors were the common cause of amblyopia (70.9%), followed by the squint (18.2%), cataract (5.5%) and ptosis (5.5%). Better outcome was seen in the age group of 5-8 years (44%), followed by age group of 9-12 years (37%) (Table 4). Poor outcome was seen in the age groups of less than 4 years (16%) and more than 12 years (14%).

Table 1: Distribution of participants based on socio-demographic variables (n=803)

Parameters	Frequency (%)
Age category (in years)	
0-6	282(35%)
7-12	335(42%)
13-18	186(23%)
Gender	
Males	468(58%)
Females	335(42%)
Religion	
Hindu	610(76%)
Christian	144(18%)
Muslim	48(6%)
Socio-economic class	
Class I	514(64%)
Class II	169(21%)
Class III	89(11%)
Class IV	31(4%)

Table 2: Distribution of Ocular diseases among the study participants (n=803)

	Number	Percentage
Refractive error	208	25.9
Squint	72	8.9
Conjunctival diseases	138	17.2
Cataract	46	5.8
Retina and optic nerve diseases	52	6.5
Childhood glaucoma	5	0.6
Adnexal diseases	105	13
Others	21	3.3
Normal	103	12.8
Corneal diseases	53	6.6

Table 3: Distribution based on types of Amblyopia (n=55)

Type	Frequency	Percentage
Isometropic	23	41.8
Anisometropic	16	29.1
Strabismic	10	18.2
Stimulation deprivation	6	10.9
TOTAL	55	100

Table 4: Outcome of amblyopia treatment after 6 months

Age group	Good outcome (n=17)	Satisfactory (n=4)	Poor (n=34)	Total (n=55)
0-4 years	1 (16%)*	0	5	6
5-8 years	8 (44%)*	2	8	18
9-12 years	6 (37%)*	1	9	16
More than 12 years	2 (13%)*	1	12	15

* Percentage across the row

DISCUSSION

In the present study, it was found that, the most common pediatric ocular morbidity was refractive error (25.9%), Mohan et al in their study, also reported refractive errors, to be the major cause of ocular morbidity 1664 (32.6%).[16] Similar to our present study findings, Adio Onakpoya et al found that refractive error and allergic conjunctivitis were accounting for almost 50% of pediatric patients presenting with ocular complaints.[17] Refractive error was more common not only in the pediatric population but also in college students (Chelliah et al, refractive error prevalence 69.4%).[18]

The current study showed a 7% prevalence of amblyopia and around 70% of them were refractive amblyopia (41.8% isometropic and 29% anisometropic). Mohan et al also reported a majority of their study participants have refractive amblyopia (82%) with 66% of anisometric and 16% as isometric type.[16]

In the present study, Isometropic amblyopia is found to be the common sub-type of amblyopia (41.8%), Menon V et al in their study to evaluate the clinical profile and distribution of different sub-types of amblyopia in a referral eye hospital in India, reported that Strabismic amblyopia to be the most common sub-type of amblyopia (37.38%).[15]

In this study, we found that 17 patients had improvement of 2 lines of visual acuity or more after 6 months of

follow up. Four patients improved by one line of visual acuity. Thirty-four patients did not improve. This may be due to ineffective patching or non adherence to refractive correction. Longer follow up is needed to find improvement in vision. In age group 0-4 years 16% patients improved, 5-8 years 55% improved, 9-12 years 46% improved and 25% in age group more than 12 years. In younger children use of glasses and patching might be difficult. Optimal age for treatment is less than 8 years after which response to therapy is poor.

Limitation: It was a short term study. Outcome of amblyopia therapy could be assessed better with long term follow up.

CONCLUSION

The Refractive error is the common ocular morbidity in children and also the most common cause of amblyopia. The treatment outcome is better in children between 5-8 years compared to children less than 5 years and children more than 8 years, suggesting more screening camps to target the age group for better visual outcome.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

REFERENCES

1. Salma KR, Hari T, Malla BA. Clinical Profile of Pediatric Ocular Morbidity in a Tertiary Eye Care Centre in Western Region of Nepal. 2015;
2. Wadhwani M, Vashist P, Singh SS, Gupta V, Gupta N, Saxena R. Prevalence and causes of childhood blindness in India: A systematic review. Indian J Ophthalmol 2020;68(2):311–5.
3. Demissie BS, Demissie ES. Patterns of Eye Diseases in Children Visiting a Tertiary Teaching Hospital: South-western Ethiopia. Ethiop J Health Sci 2014;24(1):69–74.
4. Wadhwani M, Vashist P, Senjam SS, Gupta V, Saxena R, Tandon R. A population-based study on the prevalence and causes of childhood blindness and visual impairment in North India. Indian J Ophthalmol 2021;69(6):1381–7.
5. Steinmetz JD, Bourne RRA, Briant PS, Flaxman SR, Taylor HRB, Jonas JB, et al. Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: the Right to Sight: an analysis for the Global Burden of Disease Study. Lancet Glob Health 2021;9(2):e144–60.
6. Webber AL, Wood J. Amblyopia: prevalence, natural history, functional effects and treatment. Clin Exp Optom 2005;88(6):365–75.
7. Suttle CM, Melmoth DR, Finlay AL, Sloper JJ, Grant S. Eye–Hand Coordination Skills in Children with and without Amblyopia. Invest Ophthalmol Vis Sci 2011;52(3):1851–64.
8. Neumann E, Friedman Z, Abel-Peleg B. Prevention of strabismic amblyopia of early onset with special reference to the optimal age for screening. J Pediatr Ophthalmol Strabismus 1987;24(3):106–10.
9. Simons K, Preslan M. Natural history of amblyopia untreated owing to lack of compliance. Br J Ophthalmol 1999;83(5):582–7.
10. Assaf AA. The sensitive period: transfer of fixation after occlusion for strabismic amblyopia. Br J Ophthalmol 1982;66(1):64–70.
11. Wallace DK, Repka MX, Lee KA, Melia M, Christiansen SP, Morse CL, et al. Amblyopia Preferred Practice Pattern®. Ophthalmology 2018;125(1):P105–42.
12. Papageorgiou E, Asproudis I, Maconachie G, Tsironi EE, Gottlob I. The treatment of amblyopia: current practice and emerging trends. Graefes Arch Clin Exp Ophthalmol Albrecht Von Graefes Arch Klin Exp Ophthalmol 2019;257(6):1061–78.
13. Kapadia PR, Sneha BV, Jariwala SB. Amblyopia: Effectiveness of visual screening for early detection in a comparative study between urban and rural school children. Kerala J Ophthalmol 2023;35(1):20.
14. Chandrasekar A, Rangavittal S, Krishnamurthy S, Narayanan A. Profile of ocular conditions from school eye screening in Southern India. Indian J Ophthalmol 2022;70(5):1755–60.
15. Menon V, Chaudhuri Z, Saxena R, Gill K, Sachdev MM. Profile of amblyopia in a hospital referral practice. Indian J Ophthalmol 2005;53(4):227–34.
16. Mohan A, Bisht A, Sharma VK, Jami Z. Epidemiology of Ocular Morbidity Among School-Going Children [Internet]. India Ophthalmol. Conf. Best Pap. 2017 67-90 [cited 2023 Jul 28];Available from: https://proceedings.aios.org/2017/fp1242-epidemiology-of-ocular-morbidity-among-school-going-children/
17. Onakpoya OH, Adeoye AO. Childhood eye diseases in southwestern Nigeria: a tertiary hospital study. Clin Sao Paulo Braz 2009;64(10):947–52.

18. Chelliah DR, Mahalingam K, Ganesh V, Rangasamy R, Pattabiraman S, Narayanan N. Prevalence of Refractive Error among College Students in South India: A Pilot Study. J Med Sci Clin Res 2018;6(12).

How to cite this article: Musunuru P, Rangasamy RK, Mahalingam K, Selvaganapathy A. Clinical Profile of Ocular Diseases Among Pediatric Patients Attending a Tertiary Care Hospital in South India. Ocul Res J 2024;1(2): 14-18.

Received: 14/05/2024 **Accepted:** 27/05/2024