



## The Pattern of childhood eye diseases and the awareness of parents regarding this among those who visit the Regional Institute of Ophthalmology, Trivandrum

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### Abstract

**Purpose:** To study the pattern of childhood eye diseases in children aged less than 15 years and assess the awareness of parents about this and the need for early screening.

**Design:** Cross-sectional study design

**Materials and Methodology:** A cross sectional study was done at the Regional Institute of Ophthalmology, Thiruvananthapuram on a study population of 125 children aged less than 15 years, attending the outpatient department.

Exclusion criteria included mentally retarded and severely ill children.

A sample size of 125 was considered and all consecutive patients eligible to be enrolled were included with the aid of a semi-structured questionnaire.

Study variables included socio-demographic variables and questions assessing the need of an early screening and regular follow up.

**Results:** The majority (72%) of sample population were below 10 years of age, least observed among under 1 age group(4.8%).

The mean age of diagnosis was 5.32 years, with a SD of 3.293. Refractive error with amblyopia had highest prevalence (29.6%).

66.7% had undergone no routine eye checkup.69.8% also opinioned the need for no routine eye checkup in the absence of symptoms.40.8% underwent their first eye checkup at 5-10 years while only 17.6% had a under 1 age checkup. Notable highlights include 78.4% and 67.2% parents opinioning no occurrence of cataract and glaucoma in childhood.15.2% also opinioned that childhood eye diseases can never lead to blindness.

**Conclusion:** The study highlights the need for a routine eye checkup and follow up for early onset detection and correction of childhood eye diseases to prevent a future challenge of amblyopia.

**Keywords:** Amblyopia, Refractive error, myopia, hypermetropia, Astigmatism, childhood blindness, strabismus, school screening.

## Introduction

The definition of Blindness under the National Programme for Control of Blindness and Visual Impairment (NPCBVI) is modified in accordance with the WHO Definition:

*"Presenting distance visual acuity less than 3/60 in the better eye and limitation of field of vision to be less than 10 degrees from center of fixation".*<sup>1</sup>

The control of blindness in children is now a high priority in the World Health Organization's VISION 2020— *The Right to Sight programme*<sup>2</sup>.

Visual impairment in children is associated with innumerable emotional, social and economic costs to the child, family and society. Most of these conditions associated with blindness in children are also causes of childhood mortality (e.g. prematurity, measles, congenital rubella syndrome, vitamin A deficiency, and meningitis). But interestingly, many of the causes of blindness in children are either preventable or treatable.

Children are born with an immature visual system. For normal visual development to occur, they require clear and focused images to be transmitted to the higher visual centres, which fails to occur in childhood eye disease. Failure of normal visual maturation (*amblyopia*) cannot be corrected in adult life<sup>2</sup>, so there is a level of urgency about treating childhood eye disease which does not necessarily apply to adult conditions. Furthermore, children's eyes are not smaller versions of adult eyes, because they respond differently to medical and surgical treatment. Standard teaching states that amblyopia caused by strabismus and anisometropia should be treated before an age of 7 years and the earlier the treatment, the better.<sup>3</sup>

Reduced vision because of uncorrected refractive errors is a major public health problem in school children in India<sup>4</sup>. Vision screening should be done to identify children with unsuspected remediable conditions, so that treatment can be offered before educational and social progress is affected<sup>5</sup>. Screening in school children can help to identify conditions like refractive error and amblyopia, which make up a huge proportion of

childhood eye diseases that can progress to significant visual impairment.

## Objectives

### Primary

To study the pattern of distribution of eye diseases in children aged less than 15 years

### Secondary

To assess the awareness of their parents about childhood eye disease and the need for early screening

## Materials and Methodology

**Study Design:** Hospital-based Cross sectional study

**Study Setting:** Regional Institute of Ophthalmology (RIO), Tertiary care level ophthalmology hospital attached to Government Medical College, Trivandrum

**Study period:** July 1<sup>st</sup>, 2017- September 30<sup>th</sup>, 2017

**Study Population:** Children aged less than 15 years attending the Ophthalmology OPD and their accompanying parent –either mother or father

### Exclusion Criteria

- Subjects who do not consent,
- Mentally retarded children,
- Severely ill children

**Sampling Method:** All consecutive patients attending the OPD eligible to be enrolled were included

### Sample Size:

Calculated by the formula  $4pq/d^2$ , where  
 $p=54.6\%$  (Prevalence of refractive error in an ophthalmology out-patient department in a study by Rohul et al)<sup>6</sup>

$$q=100-p \\ = 45.4\%$$

$$\text{and} \\ d=20\% \text{ of } p \\ = 10.92$$

$$\text{And } d^2 = 119.2$$

Gives a sample size of 83. With a design effect of 1.5, we get a sample size of 124.

Our sample size was 125.

**Study Variables**

Socio-demographic variables- Age and gender of children, education and socio economic status of parents.

Clinical features – Eye disease, Age of detection of disease

Parental awareness of the need for early screening, regular check up and frequent follow up

**Data collection tools and techniques**

A semi-structured questionnaire was used to collect data on the pattern of childhood eye diseases prevalent and to assess the awareness and practices of parents regarding an early screening for the same.

**Data analysis**

Data was entered in excel sheets and analysed using appropriate statistical software. All quantitative variables were expressed as mean and standard deviation and all qualitative variables were expressed as proportion. Significance level of 95% Confidence Interval was determined appropriately for all the analysis.

**Results**

Table 1: Age based distribution of population:

AGE GROUP	No. (%)
0-4	42 (34%)
5-10	48 (38%)
11-15	35 (28%)

Table 2: Gender based classification of population:

GENDER	No. (%)
MALE	54 (43%)
FEMALE	71 (57%)

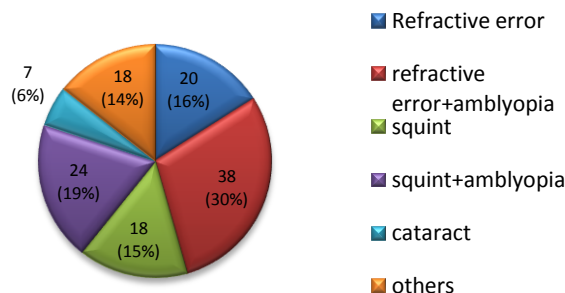
Table 3: Education-wise classification of parents

EDUCATION STATUS	No. (%)
Non-graduates	27 (22%)
Graduates	79 (63%)
Post- graduates	19 (15%)

Table 4: Socio-economic classification

SOCIOECONOMIC STATUS	No. (%)
APL	96 (77%)
BPL	29 (23%)

Chart 1 : Pattern of childhood eye diseases



The mean age of first eye check up was 5.32 years, with a SD of 3.29 years.

Table 5: Disease-wise age of diagnosis (p=0.039)

Disease	Mean age of diagnosis (in years)	Standard Deviation
Ref.Error with or without amblyopia	6.19	2.81
Squint with or without amblyopia	4.66	2.92
Others including cataract	4.82	4.213

Table 6: Gender-wise pattern of disease (p=0.37)

Diagnosis	males	females
Ref.error with or without amblyopia	37 (64.9%)	20 (35.1%)
Squint with or without amblyopia	22 (51.2%)	21 (41.8%)
Others including cataract	13 (52%)	12 (48%)

Awareness of parents regarding childhood eye-disease and the need for early screening?

Table 7: Ever felt need for routine eye check up?

Yes	51 (40.8%)
No	74 (59.2%)

**Table 8:** Any routine check-up done before disease detection?

Yes	42 (33.3%)
No	83 (66.7%)

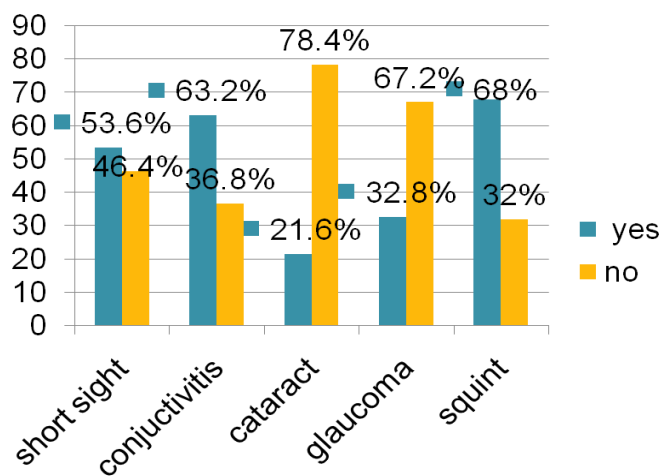
**Table 9:** Age of first eye check

At birth	6 (4.8%)
Less than 1yr	22 (17.6%)
1-3 yrs	20 (16%)
3-5 yrs	16 (12.8%)
5-10 yrs	51 (40.8%)
10-15 yrs	10 (8.0%)

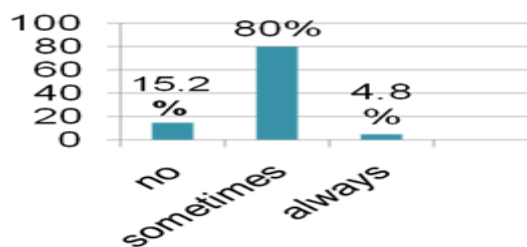
**Table 10:** Reasons for no routine eye check up

REASON	NO.OF PARENTS
IGNORANCE	28 (22.6%)
FINANCIAL REASONS	9 (7.5%)
LACK OF TIME	9 (7.5%)
INNACCESSIBILITY TO ADEQUATE HEALTH CARE	14 (11.5%)
NOT NECESSARY	64 (50.9%)

**Chart 2:** Can children suffer from any of the following



**CHART 3 :CAN CHILDHOOD EYE DISEASE LEAD TO COMPLETE BLINDNESS?**



**Table 11:** Identified by whom

IDENTIFIED BY:	No:
PARENTS	38 (30.6%)
TEACHERS	29 (23.6%)
RELATIVES	5 (4.2%)
SELF	5 (4.2%)
PEDIATRICIAN	19 (15.2%)
OPHTHALMOLOGIST	29 (22.2%)

**Table 12:** School-screening

Yes	47 (37.6%)
No	78 (62.4%)

**Discussion**

In this hospital based cross-sectional study done in the outpatient department of The Regional Institute of Ophthalmology, we studied 125 children under the age of 15 years to assess the pattern of eye diseases and their accompanying parent (mother or father) to study their awareness about the same.

42 cases(34%) were under 5 years of age, 48 cases (38%) belonged to 5-10 years of age and 35 children(28%) belonged to the 11-15 years of age. 54 cases (43%) were males and 71 cases (57%) were females. Out of the parents, 27 of them (22%) were non-graduates, 79(63%) were graduates and 19 (15%) were post-graduates. 29 of them (23%) belonged to a socioeconomic status of BPL (below-poverty-line) and 96 (77%) belonged to APL status (above-poverty-line).

Uncorrected refractive errors form the primary cause for visual impairment and blindness in India<sup>7</sup>. This warrants early detection and treatment of these problems to prevent future blindness. Refractive errors comprised the maximum of 58 cases (46%) of which 38 cases (30%) was detected to have amblyopia.

Strabismus was present in 42 cases (34%), in which 24 cases (19%) were amblyopic. So the incidence of amblyopia detected was very high-62 cases (49%).

Prevalence of refractive errors varies depending upon population under study, and the age group under consideration<sup>8</sup>. This high incidence maybe due to the fact that this was a hospital-based study where most cases were referred and due to the fact that, majority of the kids were more than 5 years old at the time of the detection.

The mean age of first eye check up was 5.32 years. When age of diagnosis was evaluated disease-wise, refractive error which is the most important cause of amblyopia was the one diagnosed very late, mean age of diagnosis being 6.19 years, which is well beyond critical age for visual development.

In the qualitative analysis by questionnaire method, 74 parents (59.2%) felt that there was no need for routine eye check-up and 83 cases (66.7%) had no routine checkup done before disease detection. When reasons for no routine eye check-up were analyzed, 50.9% felt that it was not necessary.

In our study, it was found that it was the parents who identified the disease.

Routine school screening is essential for detection of disease as children grow. But in our study, 62.4% had no school screening even done.

A large proportion of our parents believed that cataract (78.4%) and glaucoma (67.2%) never occurred in children. And 15.2% of parents also opinioned that childhood eye disease can never lead to blindness. This highlights the lack of knowledge in parents about eye disease.

## Conclusion

- Majority (40.8%) underwent their first eye checkup only at 5-10 years. Only 17.6% had eye checkup before one year of age.
- Refractive error with amblyopia had highest prevalence (30%) followed by squint with amblyopia (19%).
- Majority (66.7%) had undergone no routine eye checkup. 69.8% also opinioned the need for no routine eye checkup in the absence of symptoms. This highlights the lack of awareness among parents
- A large proportion of parents believed cataract (78.4%) and glaucoma(67.2%) never occurred in children. Notably,15.2% also opinioned that childhood eye diseases can never lead to blindness. This highlights the lack of knowledge in parents about eye diseases
- School Screening was not done for 62.4% of children

## Recommendations

- The study highlights the need for routine eye checkup and follow up for early onset detection and correction of childhood eye diseases to prevent a future challenge of amblyopia -a major cause of childhood blindness
- Parental awareness of the same is of utmost importance or early checkup and detection of diseases
- Routine screening of children at preschool and school age should be strengthened and made mandatory.

## Limitations

This study does not reflect the entire strata of the community since it is a hospital based study. This holds scope for its extension into a community.

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