

Refractive Error And Visual Function In Children Attending The Out Patient Department At Kle's Dr. Prabhakar Kore Hospital And Medical Research Centre

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Abstract:

Developmental disabilities are on a rise in children in the present time. Ocular and visual anomalies are frequently associated with it of which refractive errors are the most frequent. This if goes unnoticed leads to intellectual disability in them. This study aims to assess all the children attending the Ophthalmology OPD for any refractive error and give correction for it. It also aims to identify the children with developmental disabilities and classify the refractive errors in them and provide rehabilitation. 113 consecutive children from 1-15 years of age who attended the Ophthalmology OPD from October 2014 to September 2015 were evaluated for Demographic data, ocular complaints, status of visual acuity and type of refractive error. 75% out of 68 children with ID had refractive errors. Hypermetropia accounted for the higher proportion of cases in both normal and special needs. Owing to the high percentage of refractive error, ophthalmological referral becomes essential in children with developmental disabilities.

Keywords: Childhood Blindness, Refractive Error, and Developmental Disabilities

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Introduction:

Developmental disabilities are on the raise in children, with a 5-10% prevalence.¹ A developmental disorder is described as failure of a specific ability to present within the expected time frame. Delayed development proceeds similar to normal development but at a slower rate.

There is an increasing frequency of ocular and visual anomalies among children with developmental delay.² Of the various ocular manifestations, refractive error is the most common finding (51%), followed by optic atrophy (21%), strabismus (18%) and cortical visual impairment (11%).³

Although ID is not treatable, associated impairments are amenable to intervention

and benefit from early identification and vision is one of them. Undetected visual impairment may lead to an underestimation of intellectual ability.⁴ Warburg reports that mentally handicapped children with visual impairments are inappropriately classed as profoundly handicapped more often than sighted children with equivalent levels of mental handicap.⁴ All this occurs because of unidentified, uncorrected refractive errors. This hampers their sensory input going to the brain development. This applies for the syndromic and non-syndromic distinctions too.

The objectives of the study were to evaluate the all the children attending ophthalmology OPD for ocular complaints; to assess the refractive status and give correction with spectacles; to know the associated Developmental disability if any.

Materials and methods:

All consecutive children from 1-15 years of age attending the Ophthalmology outpatient department were included in the study.

Progressive neurodegenerative conditions like Neurodegenerative disorders and children with no perception of light were excluded. The study conducted from October 2014 to September 2015.

Method:

All consecutive children from 1 to 15 years of age attending the Ophthalmology OPD of KLES hospital were enrolled after taking informed consent from the legal guardian/parent.

Demographic data, ocular complaints, status of visual acuity and type of refractive error were included in the questionnaire.

Visual Acuity was measured at a distance of 6 meters using the Snellen E Chart and was classified as per WHO classifications: $\geq 6/18$, $< 6/18-6/24$, $6/24-6/60$, $< 6/60-3/60$, and $< 3/60$ - NLP. Children in whom the above method was not feasible Preferential looking test using Teller acuity cards (TAC) were used to assess the Vision.

Complete ocular examination was done including anterior segment examination by slit lamp and torch. Posterior segment examination was carried out by dilated funduscopy.

Glasses are prescribed on the basis of cycloplegic retinoscopy.

Definitions and Statistical Analysis:

The patients were classified into three age groups (< 5 years, 6-10 years, 11-15 years) and evaluated. Term global developmental delay/GDD is reserved for children younger than five years, whereas the term intellectual disability/ ID is usually applied to older children, when IQ testing is more valid and reliable.^{5,6}

Statistical analysis was carried out with SPSS 20.0 statistics package. All the children with ocular disorders

were prescribed spectacles. Caretakers were counseled regarding the environment of the child, which is to be made low vision friendly.

Results:

Description of the Study Population:

A total of 113 children were examined during the study period. Out of them 62 (54.9%) were males and 51 (45.1%) were females with mean age of 4.25 years \pm 3.02 (age range 1-15 years).

**Table 1:
Study Population**

Gender	Number
Male	62
Female	51
Total	113

**Table 2:
Age Groups**

Age Groups	Number
Under 6 years	77
6-10 Years	31
11-15 Years	5
Total	113

Table II depicts the Age Groups in which the subjects were classified. Most of the children were in the age group below 6 years (68.1%) followed by 6-10 years (27.4%) and above 10 years (4.4%).

**Table 3:
Subject Classification**

	Number
Normal	45
Special needs	68
Total	113

Table III depicts that Out of the total subjects evaluated, 68(60.2%) presented with intellectual disability, which is considerable high owing to the fact that the study was carried out in the children attending the outpatient department for some complaints.

Status of Refractive Error:

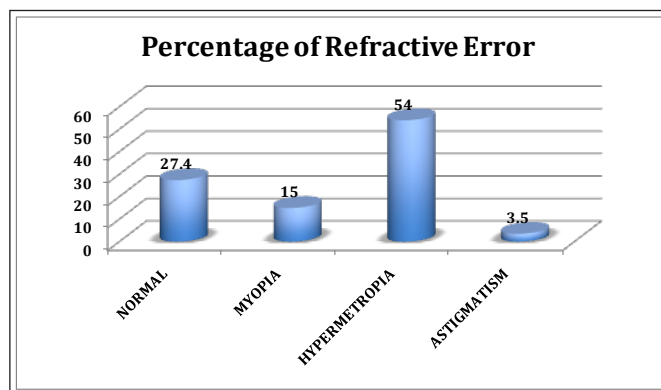


Figure I: Percentage of refractive error

As shown in the figure 1, in the present study maximum children were diagnosed with Hypermetropia followed by myopia and astigmatism while 27.4% children were without any refractive error.

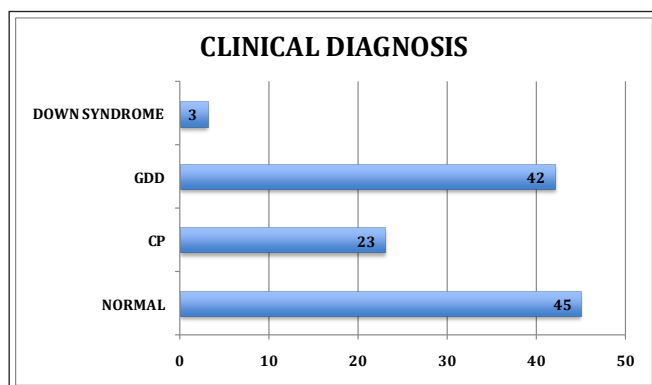


Figure II: associated clinical disease

Figure 2 shows that maximum children were free of any associated disease. 42 children had Global developmental delay, 23 children had some form of cerebral palsy and 3 cases of Down syndrome presented to the outpatient department.

Discussion:

Visual impairments affect intellectual development and motor achievement by hampering neurological development i.e., defects of the ocular refractive system reduce the visual input, which further inhibits sensory, perceptual and cognitive development.⁸ Unrecognized visual impairment is a missed chance for adequate treatment

American association of neurologists says that early diagnosis of a child with global delay may improve outcome i.e., in their formative early years

Prompt identification and correction of refractive errors makes a huge impact on their daily functioning, as this is “treatable visual impairment”.

Most of the studies evaluating ocular findings in individuals with intellectual disability done from a public health perspective have been on adults. This being a major constraint, since at this age, they develop amblyopia and are beyond any treatment.

We have tried to focus our study on the paediatric age group but subject’s upto 15 years of age are include in the study.

Limitation: all subjects recruited were from hospital ophthalmic outpatient department, so these may not be representative of the general population as a whole.

If taken from general population, then the difference between the two groups would probably be more marked.

The ID groups included patients as young as one year of age, where as the children with normal development usually attend the hospital at a slightly later age-majority falling in the 1-15 years age group. Age is a significant factor because many outcome variables change drastically with age in the normal children in the first few years.

Uncorrected refractive errors are the main cause of vision impairment in children of both categories according to WHO.⁹ This issue remains unaddressed in majority of countries all over the world.

In our study, 75% out of 68 children with ID had refractive errors. The study done in Oman had a prevalence of 58.5% in children with special needs.¹⁰

Castanet et al. study showed a prevalence of 58.7% in a similar setting. All these studies were carried out on mentally challenged kids in the age range of 5-16 years.¹⁰ The Oman study also found 80% prevalence of refractive errors in children with Down syndrome.¹⁰ Since our study included children under 5 years kids also and majority of cases were of Global developmental delay, followed by cerebral palsy, explains the higher prevalence of refractive errors.

Our study also had a high proportion of refractive errors in normal children, i.e., 68.8%. This disproportional prevalence can be explained by the fact that these kids are

the ones attending the hospital with some ocular complaints, in contrast to other studies done in healthy school going children.¹⁰

Hypermetropia accounted for the higher proportion of cases in both normal and special needs, correlating with all other studies. However, there was no difference in the pattern of distribution of various refractive errors in both the groups.

Conclusion:

Referral to ophthalmic care is quintessential for their overall development and optimum care.

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