

Prevalence and Pattern of Refractive Errors in Children

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ABSTRACT

Aim: To find out the prevalence and pattern of refractive error in children

Study Design: Descriptive study.

Place and duration of study: Department of Ophthalmology & Department of Pediatric, Niaz Medical and Dental College Sargodha from 1st January 2018 to 31st December 2019.

Methodology: All the children come in the OPD for refraction or referred from Pediatric Department due to decrease of vision were included and comprised 250 children. All children were examined by the optometrist and ophthalmologist. Objective and subjective refraction were performed and relevant data was recorded by the optometrist.

Results: There were 175(70%) females and 75(30%) were males. The major refractive errors were myopia 40% and astigmatism 16% above age of 5 years and <5 years, hypermetropia 24% was dominant finding. A significant number of children also suffer from malnutrition and present as a migraine (25%), blurring of vision (30%) and asthenopic symptoms (50%). Amblyopia was also seen. It was also challenging problem and parents and children were counsel about it and treat it.

Conclusion: An increased prevalence was seen particularly myopia and astigmatism.

Keywords: Myopia, Hypermetropia, Astigmatism, Asthenopia

INTRODUCTION

In ophthalmology every topic revolves around the vision. The vision development starts after birth in children having problems since birth suffer from different types of problems. Nystagmus starts early because fixation reflex develop during 3 to 4 months of life. Vision development continued up to 12 years of life along with the development of different parts of brain and stable around the age of 20 years. The beginning time of vision development is very important because at that time if we assess the child we can prevent from blindness and different types of other problem like squint and amblyopia¹.

Many studies have been conducted to determine the prevalence of refractive errors throughout the world²⁻⁵. Some studies have been conducted in Pakistan^{6,7,8}. Our main focus is the comparison of these studies with our study to rule out the magnitude of problems in children. It helps to highlight the children issues in our society regarding their eye health and their variety of problems. By doing this we can decrease the no of blindness and make our society healthy physically and mentally.

Uncorrected refractive errors are an important cause of visual impairment in many countries. According to WHO (World Health Organization), approximately 19 million children and adolescent 5 to 15 years of age suffer from visual impairment, out of which about 12.8 million cases 67% are due to uncorrected refractive error.⁹ The refractive error was responsible for 11% legal blindness (which is defined as vision less than 6/60) and 0.5% economic blindness reported^{9,10}. Our study not only helps the early

correction of refractive error but also create awareness among patients, teachers and primary health workers.

PATIENTS AND METHODS

This descriptive study was conducted at Department of Ophthalmology & Department of Pediatric, Niaz Medical & Dental College Sargodha from 1st January 2018 to 31st December 2019 and comprised 250 children. Children suffering from NLD problems, allergy, infections (viral, bacterial conjunctivitis) and Neurological disorders excluded from this study. Children coming in OPD, their visual acuity were done by trained and qualified optometrist. Visual acuity was recorded by Snellen's Acuity Chart. In school going children English letters or Urdu letters of Snellen's acuity chart was used and in Non-school going children picture chart was used. After taking and recording the vision he referred the child to consultant ophthalmologist. In children having visual impairment their refraction is done. If improved 6/6 glasses were advised. In cases of non-improvement, PH (pin hole) test and cycloplegic refraction done with 1% cycloplegic. At the end Fundoscopy was done. Regarding glasses parents counselling done. In cases of amblyopia explain the parents about amblyopia therapy and for making good compliance we make sure that they come on regular basis with their children on follow up visits at hospital until child improved up to standard level of vision. Children which were not improved we make extra sitting with their parents in which detailed history is taken. Detailed examine under sedation in small children were done. Children which come in low vision AID criteria and legal blindness, referred to the tertiary care centre to the pediatric ophthalmologist. The data was entered and analyzed through SPSS-20.

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RESULTS

There were 175 females and 75 were males. One group has children up to 5 years of age and other group has children above 5 years of age. Up to 50% children have refractive errors of different type and rest of have problems due to malnutrition and suffering from headache, vomiting, asthenopic symptoms, migraine and blurring of vision. The major refractive errors were myopia 20% below and 40% above 5 years of age children and simple astigmatism was 10% and 40% below and above 5 years age respectively. Now-a-days other problems are also emerging in children like migraine (25%) and simple headache (Tables 1-3).

Table 1: Distribution of refractive errors according to sex

Gender	No.	%
Male	75	30.0
Female	175	70.0

Table 2: Distribution of age according to refractive errors

Types of refractive errors	Below and up to 5 years	Above and up to 5 years
Myopia	20 (8%)	100 (40%)
Hypermetropia	60 (24%)	10 (4%)
Simple astigmatism	10 (4%)	40 (16%)
Compound astigmatism	5(2%)	5(2%)

Table 3: Distribution of children according to other problem

Problem	No.	%
Migraine due to malnutrition	50	25.0
Asthenopia	100	50.0
Vertigo vomiting	40	20.0
Blurring of vision	60	30.0

DISCUSSION

Refractive errors if does not treated causing a bad impact on learning capabilities and educational potential of child.¹¹ Most of children referred by their school teachers because their efficiency is affected by their visual problems.¹² Refractive errors are different types. Myopia is a type of error in which distant objects are imaged in front of retina.¹³ Hypermetropia is a type of refractive error in which image is formed behind the retina. Astigmatism is defect of optical system causing Ray's from a point to fail to meet in a focal point resulting in blurred and imperfect image.^{14,15}

In the present study we see that myopia is a major type of refractive error above the age of 5 years (40%). It increases in school going children. Hypermetropia was more common in less than 5 years age children (24%). It was mostly refractive accommodative type and by giving full cycloplegic refraction it was fully corrected. In such cases not only children vision improved their squint also become better.^{16,17}

Astigmatism is increasing when we compare it with different studies.^{18,19} It was due to over use of mobile, video games, laptops.^{20,21} Most of children come in OPD they are using uncorrected glasses. Even with the use of these glasses they are not fully corrected and their vision is not 6/6.¹⁶ We prescribed them full spherical and cylindrical correction and on their follow up visits they became 6/6. Most of our general ophthalmologist not prescribed full correction.

Another problem which is emerging in children is malnutrition.²² Most of the children go school without breakfast. The reason is the use of junk food, increasing and children sleep at late night. So in the morning they are not fresh and go school without breakfast. Due to these problems they suffer from migraine (25%), asthenopic symptoms (50%), vomiting (20%) and blurring of vision (30%) and their parents take to OPD for eye problems. When we check the vision of these children it is normal²³, so we tell them about the life style of children. Their eating habits and sleeping habits should change. Children should take balance diet, some sports activity and early sleep and in this way most children become normal with the passage of time.

Another important problem observed in children was amblyopia^{24,25}. Although its percentage is less but it is very significant problem because we can correct it up to the age of 15 years according to the most studies²⁶. Although the trial of amblyopia therapy can be given at any age^{27,28}. In amblyopic children we teach the parents about amblyopia therapy. Its not only parents compliance which make this effort successful, the children should also fully involved and make a regular and disciplined habit, that is a key to success for management of amblyopia. We check that children on regular basis and payspecial attention to them.

CONCLUSION

An increased prevalence was seen particularly myopia and astigmatism. It is very important to check up the child on school going age because many problems can be solved at this stage because children are passing from visual development period. Their physical and mental capabilities can increase. In case of children having refractive error it should be fully prescribed. Children diet should balance for prevention of allied problems (migraine, asthenopic problems) along with correction of refractive errors.

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