

Pattern of Refractive Error among Amblyopic Children at tertiary referral hospital of Ahmedabad, Gujarat.

Dr.Vaishali Prajapati^{1*}, Dr. Surili Vyas², Dr.Sneha Garasia³, Dr.Dharti Thakkar⁴, Dr.Kushang Shah⁵, Dr.Deepika Singhal⁶

¹ PHD Scholar of Gujarat University, Ahmedabad and Associate Professor, ² 3rd Year Resident, ³ 2nd Year Resident, ⁴ 3rd Year Resident, ⁵ 3rd Year Resident, ⁶ Professor and Head, Department of Ophthalmology, GMERS Medical College, Sola, Ahmedabad

Corresponding Author: Dr.Vaishali Prajapati

E Mail drvaprajapati@gmail.com



ABSTRACT

Introduction: Amblyopia is one of the common causes of preventable unocular or binocular vision loss in children. Timely diagnosis and management of amblyopia is crucial. If corrective measures are not taken in time it becomes permanent. **Aim:** To study the various types of refractive errors in amblyopic children aged 5-18 years in tertiary eye hospital. **Materials and Methods:** Retrospective cross-sectional study was carried out in the tertiary eye care hospital. All the children attending the ophthalmology OPD during January 2021 to January 2023 were enrolled. All underwent detailed ophthalmic evaluation. After post mydriatic test, children with difference of two lines or more in visual acuity on Snellen chart were taken and detailed ophthalmic evaluation done. **Results:** The prevalence of amblyopia was 6.2% (n=48) with male dominant of 62.5% (n=30), while female was 37.5% (n=18). In types of Amblyopia, most common was simple Hypermetropic of 42% (n=20) followed by simple myopic and hypertropic Astigmatism 19% (n=9) in each. The Anisometropia Amblyopia was in 12% (n=6), while myopic astigmatism in 8% (n=4). The 69% (n=33) was binocular while 31% (n=15) was unocular amblyopia. **Conclusion:** The Refractive errors are treatable and preventable cause of amblyopia. Timely diagnosis and proper treatments like spectacles, contact lenses, patching and active vision exercises, we can treat Amblyopia and prevent the psychosocial, economical loss in adult life.

Keywords: Myopia, Hypermetropia, Anisometropia, Astigmatism

INTRODUCTION

Amblyopia is a common vision disorder among children and the most common cause of vision loss and monocular blindness in children. It is defined as decreased vision due to abnormal visual cortex development in infancy or childhood^{1,2,3}. It can be caused by any condition that creates a disparity in vision between the two eyes.¹ However, most cases are reportedly caused by strabismus and Anisometropia^{1,2,3}.

Amblyopia is a major preventable and treatable cause of low vision in the pediatric age group, as per Vision 2020. If not treated appropriately, pediatric Amblyopia can result in monocular and binocular low vision with associated deterioration in Quality of Life indices in adulthood.⁴ It has been shown that early recognition and management of amblyopia risk factors will decrease vision loss in children and increase the quality of life of adults.²

The World Health Organization (WHO) has estimated that 19 million children under 15 years of age are visually impaired; of those, 12 million are impaired due to uncorrected refractive errors and Amblyopia.⁵ The prevalence of Amblyopia is often underestimated due to parents' lack of awareness and knowledge about refractive errors in children and late ophthalmological referrals for visual screenings. The prevalence of Amblyopia worldwide is estimated at approximately 1%–5%.^{6,7,8} A study in the Kurnool district of Andhra Pradesh reported Amblyopia prevalence as 6.6%.⁹ However,

there is a lack of such studies on the prevalence of Amblyopia in Gujarat. The objective of the present study is to document the prevalence and types of Amblyopia amongst children aged 5-18 years in a tertiary eye hospital in Ahmedabad, Gujarat.

AIM AND OBJECTIVE

To study the various types of refractive errors in amblyopic children aged 5-18 years in tertiary eye hospital

MATERIALS AND METHODS

A retrospective cross-sectional study was carried out amongst the children aged 5-18 who attended the ophthalmic OPD from January 2021 to June 2022 in the tertiary care hospital of Ahmedabad. The study was approved by the institutional ethical and research committee. The study included all children of 5-18 years of age with poor vision who visited the ophthalmology OPD during the reference period. The poor vision is documented with help of Snellen chart and picture charts. The dilated retinoscopy was performed in all candidates. All the selected children underwent detailed ophthalmic evaluation including- detailed history, uncorrected vision, cover test, slit lamp examinations, dilatation with 2 % homatropine eye drops, dilated refraction, detailed fundus by indirect ophthalmoscope, fundus fixation by direct ophthalmoscope and post mydriatic test after three days. The glasses were advised in all cases with occlusion as when as required.

Criteria for diagnosis: In the study, unilateral Amblyopia was defined as a 2-line difference in BCVA between two eyes, while bilateral Amblyopia was defined as bilaterally decreased BCVA was <6/12 on the Snellen chart.

RESULTS

Of a total of 2540 children who were screened from January 2021 to June 2022, 160 children were Amblyopic. The prevalence was 6.2% of the pediatric population. As presented in **Table-1**, the most common type of Amblyopia was strabismus 44% (n=71), followed by Refractive 30% (n=48) and stimulation deprivation 26% (n=14). The most commonly affected age group was 10-15 years, with male dominant of 14 (30%) children. Of Amblyopic children, 31% had uniocular, and 69% had binocular Amblyopia.

Table-1: Types of Amblyopia

Types	Number	Percentages
Strabismus	71	44%
Refractive	48	30%
Stimulation Deprivation	41	26%
Total Children	160	100%

In refractive Amblyopia, the most common type of refractive error was Hypermetropia (42%), followed by Myopia (19%) and Hypermetropic Astigmatism (19%), Myopia Astigmatism (8%) and Anisometropia 12% of children (**Table-2**).

Table-2 : Types of Refractive errors among Amblyopic Children

Refractive Errors	Male Children	Female children	Total	Percentage
Simple Hypermetropic	15	5	20	42%
Simple Myopia	5	4	9	19%
Hypermetropic Astigmatism	4	5	9	19%
Anisometropia	3	3	6	12%
Myopic Astigmatism	3	1	4	8%
Total	30	18	48	100%

The distribution was similar in both female and male groups.

DISCUSSION

The prevalence of Amblyopia in the present study was 6.2%, higher than previous studies that documented the prevalence between 1% and 5%.^{1,3,6,10} In contrast, a survey conducted in Uttarakhand amongst school-going children reported a prevalence of 8.6%.^{9, 11} The most commonly affected age group was 10-15 years, with male dominance of 14 (30%) children in the present study. Similarly, a retrospective study conducted in a tertiary care hospital in Uttarakhand reported a high prevalence among males compared to females. In Males, Amblyopia was 61.2%, and in females was 38.7%.¹¹ The finding is also consistent with the hospital-based study from Nepal; 54% of the males had Amblyopia¹².

In the present study, Hypermetropia was the most common type of refractive error. The finding is consistent with the survey conducted by Menon et al., which reported that Amblyopia due to Hypermetropia was the highest (51.65%). Anisometropia amblyopia was the second most common (22.1%) after strabismus amblyopia (37.38%), followed by ametropic Amblyopia 12.88%, and meridional Amblyopia 5.56%.¹³ In contrast, a prospective study conducted amongst school-going children reported Anisometropia as the most common type of Amblyopia.⁴ A study in Uttarakhand reported that Astigmatism was the most common refractive error (41.93%) in the sampled population.¹¹

In the present study, bilateral Amblyopia was higher (69%) than unilateral Amblyopia (31%), which is consistent with the study done in Uttarakhand¹¹. In contrast, the study done in Nepal reported that 71% of unilateral Amblyopia¹² and a survey by Menon et al. also found that only 7% of cases were bilateral.¹³

CONCLUSION

Refractive errors are a treatable and preventable cause of pediatric Amblyopia. Timely diagnosis and proper treatments like spectacles, contact lenses, and patching will prevent Amblyopia, which has significant psychosocial and economic loss in adult life. The present study also emphasizes the need for screening and awareness programs to educate the community and parents for early detection and management of this public health problem.

LIMITATION OF THE STUDY

The limitation of the present study is only one hospital-based study with less sample size with limited duration. There is a need for a more extensive community-based study to explore the burden of this disease in the community.

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