

Types of Anisometropia in Children 5-15 Year of Age Attending a Tertiary Care Hospital

Saima Ghufra¹ Matiullah²

ABSTRACT

Aim: This study aimed to determine the types of anisometropia in patients presenting in a Tertiary Care Hospital.

Study design: This was a prospective, descriptive study.

Duration and Settings of the Study: This study was conducted at Al-Nafees Medical Hospital from December¹ 2022 to February 2023.

Methods: All new patient from 5-15 years old children diagnosed of having anisometropia of more than or equal to 1.00DS who attended the Tertiary Care Hospital during the study period were included.

Results: Out of 50 patients, most patients (56%) were in the 5-10 year age group while 44% were in the 11-15 year age group. Astigmatic anisometropia was the most common types of anisometropia (48%) followed by hyperopic anisometropia (40%). The frequency of patients with anisometropia of 1 to 2.9 DS was more common in age group 11-15 year. The frequency of anisometropia was higher in female children.

Conclusion: The high frequency of anisometropia was more common in female patients. In children age 5-15, the eyes should be examined once a year because it is the age when most children are affected and are not able to recognize it.

Key words: Anisometropia, Astigmatism, Refractive error

INTRODUCTION

Anisometropia is derived from the Greek words: an, iso, metr, and opia. Their meaning (in parentheses) is simple¹⁻² An- means not -iso-means equal -metr-means to measure and -opia means: vision a condition in which the two eyes have unequal refractive powers.³⁻⁶ One eye may be myopic (nearsighted) and the other hyperopic (farsighted) or one eye may be markedly stronger than the other, and vice versa⁷ Anisometropia is a serious concern in newborns and young children because it can lead to amblyopia⁸ With a high degree of anisometropia, the brain can not reconcile the difference in images from the two eyes. It develops a preference for the image coming

from one eye and suppresses the image from the other eye and, in time, the brain loses the ability to "see" the image from the suppressed eye⁹⁻¹¹ There is considerable variability in the prevalence of anisometropia worldwide¹² A study conducted in Iran based on cut points of 0.5 D, 1.0 D, and 2.0 D or more, estimated the prevalence of anisometropia to be 17.0%, 5.6% and 1.7% respectively¹³ The odds of anisometropia showed a significant increase of 2.8% with every year of aging¹⁴ The prevalence of anisoastigmatism was estimated to be 5.6%, anisomyopia 2.6% and that of anisohyperopia as 2.8%.¹⁵ According to the population based study of eye health in Australian school children, spherical equivalent anisometropia (>1 dpt) prevalence was 1.6% while aniso-astigmatism (>1D) prevalence was 1.0%. Both conditions were significantly more prevalent among moderately hyperopic (SE>2.0D) than mildly hyperopic (SE 0.51.9D) children¹⁶ Myopic children (SE<-0.5D) had higher anisometropia prevalence¹⁷ A person with two different powers in

Correspondence

Saima Ghufra
saimaghufra@gmail.com
Pakistan institute of Rehabilitation Sciences, Isra
University, Islamabad Farash Town Phase II Letherar
Road, Islamabad, Pakistan

¹ Al Nafees Medical College And Hospital Islamabad, Pakistan

² Senior Lecturer Vision Sciences at Pakistan Institute of Rehabilitation Sciences, Isra University, Islamabad, Pakistan

COI: The author has disclosed no conflict of interest.

each eye when seeing a single object, one eye will make a brighter and the other will make a dim image of the object, and the refractive power alteration size of the retinal image will also vary from eye to eye. Therefore, the patient experiences difficulty in focusing and estimating the size and depth of the object. Beside this patient may also experience asthenopia, fatigue, headache, nausea and discomfort and sometimes eye staining and ocular pain too¹⁸ The aim of this study was to determine the frequency of anisometropia in children presenting to the hospital.

METHODS

This was a prospective descriptive study. This study was conducted in a tertiary care hospital. The duration of the study was 3 months. All new patient from 5-15 years old children diagnosed of having anisometropia of more than or equal to 1.00DS, attending the OPD during the study period were included.

Patients who did not fulfill the study criteria, those with mental retardation, and those with strabismus were excluded from the study. All patients with anisometropia with a difference of 1.00DS or more between the eyes presenting at both hospitals during the study period were included in the study. Each patient who presented to the OPD underwent a complete visual assessment. After obtaining informed verbal consent.

Those with a difference of 1.00DS or more were identified as anisometric. Patients' personal data and assessment findings were recorded on the prescribed proforma. In this study, anisometropia was categorized into myopic anisometropia, hyperopic anisometropia, astigmatic anisometropia, and antimetropia.

RESULTS

Fifty patients were included in this study, of which 50% were male and 50% were female. Most patients (56%) were in the 5-10 year age group, while 44% were in the 11-15 year age group. Astigmatic anisometropia was the most common type of anisometropia (48%) followed by hyperopic anisometropia (40%).

Myopic anisometropia was found in 8% patients while only 4% cases were identified of having antimetropia as seen in figure 1.

The difference in refractive error in both eyes was divided into groups. Group one included 1-2.9 DS, group two included 3-4.9 DS while group three ranged from 5-6.9DS. The number of patients in each group is shown in Figure 2. The frequency of hyperopic anisometropia was greater in group 1 (age 5-10) as compared to group 2 (age 11-15). The other parameters are shown in figure 3. Study showed that in males, astigmatic anisometropia was more common, whereas hyperopic anisometropia was more frequent. The relationship between sex and the type of anisometropia is shown in figure 4. Frequency of patients with anisometropia of 1-2.9 DS was more common in age group 11-15 years. Each anisometropia group with respect to age group is shown in Figure 5. In female frequency of patients with anisometropia was more. The frequency of patients in each anisometropia group with respect to sex is shown in Figure 6.

Figure 1: Distribution of Anisometropia by Degree.

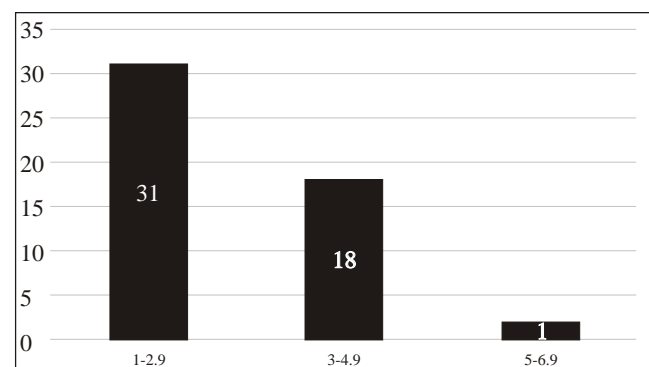


Figure 2: Anisometropia Distribution According to age Group.

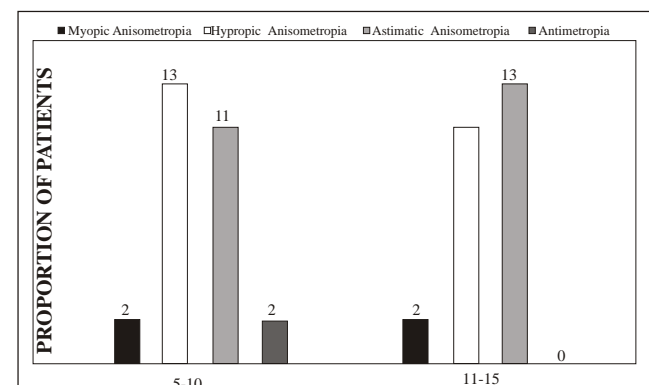
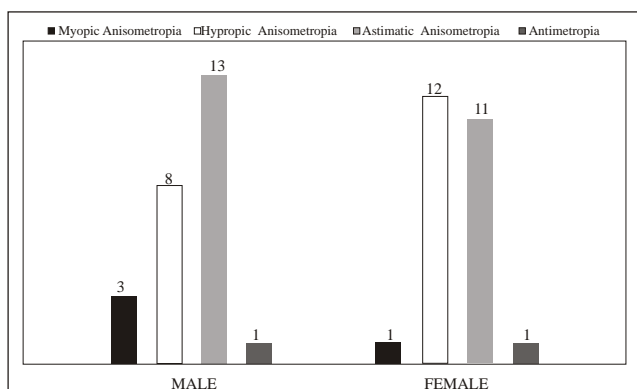
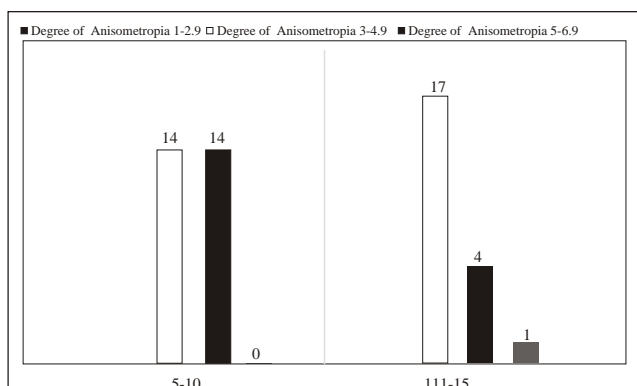
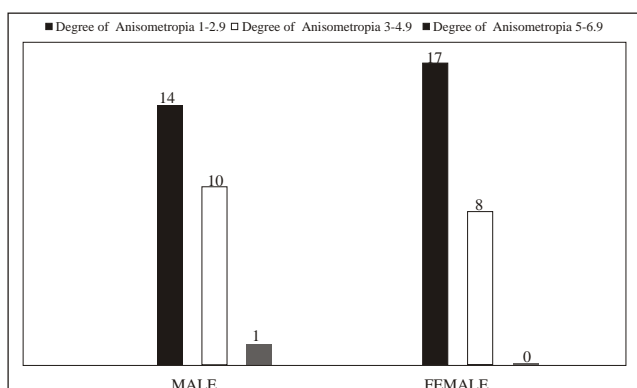


Figure 3: Distribution of Anisometropia According to Gender**Figure 4: Comparison of Age Group and Degree of Anisometropia****Figure 5: Gender Based Distribution of Degree of Anisometropia**

DISCUSSION

Anisometropia is a medical condition that affects binocular vision, especially in infants and children. It is characterized by non-symmetric vision or eyes that have unequal and different refractive powers, which cause varying or unequal rotations, leading to diplopia and asthenopia.

In Saudi Arabia anisometropic hyperopic amblyopia was the commonest type of amblyopia found (1.91%).¹⁶ In USA anisometropia was found in approximately 69% Caucasians; 6% African Americans; 17%

Hispanics and 11% Asians¹⁷

In our study, type of anisometropia with relation to age group, frequency of hyperopic anisometropia was more between age 5-10 65% as compared to frequency of astigmatic anisometropia between age 11-15 reported by Prabhu et al (54.2%).¹⁸

In contrast relation with gender, the frequency of hyperopic anisometropia was higher in women than in male. Greater incidence of myopic anisometropia and astigmatic anisometropia was found in males¹⁹ The frequency of patients with anisometropia of 1.00-3.00 DS was more in age group 11-15. In female frequency of patients with anisometropia was more²⁰

Conclusions

The high frequency of anisometropia was more common in female patients. In children age 5-15 school the eyes should be examined once a year because it is the age when most children are affected and are not able to recognize it.

REFERENCES

1. Tajbakhsh Z, Talebnejad MR, Khalili MR, Masoumpour MS, Mahdavi azad H, Mohammadi E, Keshtkar M, Nowroozzadeh MH. The prevalence of refractive error in schoolchildren. Clin Exp Optom 2022 Nov;105(8):860-864. Doi:10.1080/08164622.2021.2003687.
2. Saleem AA, Siddiqui SN, Wakeel U, Asif M. Anisometropia and refractive status in children with unilateral congenital nasolacrimal duct obstruction. Taiwan J Ophthalmol 2018 Jan;8(1):31. doi: 10.4103/tjo.tjo_77_17.
3. Nausheen N, Fahim MF, Azam P. Acceptance of correct visual acuity prescription after counseling in patients with Anisometropia. Biom Biostat Int J 2018;7(4):364-7.
4. Tegegne MM, Assem AS, Merie YA. Prevalence and Associated Factors of Amblyopia Among School Age Children at Bahir Dar City, Northwest Ethiopia: A Community-Based Cross-Sectional Study. Clin Optom 2021;13:143-53. doi:10.2147/OPTO.S293446.

5. Jarwal PN, Singh R. Evaluation of Amblyopia in School Going Children. *Delhi J Ophthalmol* 2020 Jan 13;30(3):46-50.
6. Wang X, Pan J, Zhang Y, Lan Y, Zuo J, Jiang Z. Prevalence and Associations of Myopic Anisometropia in Chinese Adults. *Eye & contact lens*. 2020 May 1;46(3):147-53. doi: 10.1097/ICL.0000000000000627.
7. Darshan SM, Sangeetha T, Kanthamani K, Laxman BH. Prevalence and Pattern of Refractive Errors in School Children (Aged 5-15 Years) of Kolar City. *Int j res eng sci manag* 2018;6(60):4.
8. Mostafaie A, Ghojzadeh M, Hosseinifard H, Manaflouyan H, Farhadi F, Taheri N, et al. A systematic review of Amblyopia prevalence among the children of the world. *Rom J Ophthalmol* 2020 Oct;64(4):342. doi:10.222336/rjo.2020.56.
9. Madhavan I, Batumalai UM, Barodawala FS, Ariffin AE. Prevalence of Myopia Among Indian School Children in Kuala Lumpur. *Online J Health Allied Sci* 2018;17(1):7.
10. Li YP, Zhou MW, Forster SH, Chen SY, Qi X, Zhang HM, et al. Prevalence of amblyopia among preschool children in central south China. *Int J Ophthalmol* 2019;12(5):820. doi: 10.18240/ijo.2019.05.19.
11. Hashemi H, Pakzad R, Yekta A, Bostamzad P, Aghamirsalam M, Sardari S, et al. Global and regional estimates of prevalence of amblyopia: A systematic review and meta-analysis. *Strabismus* 2018 Oct 2;26(4):168-83.
12. Sharma S, Ojha S. Assessment of pattern of amblyopia in children in the age group 5 to 15 years. *Eur J Mol Clin Med* 2022;9(03):1574-80.
13. Yassin SA, Al-Dawood AJ, Al-Zamil WM, Al-Ghamdi MA, Al-Khudairy ZN. Comparative study of visual dysfunctions in 610-year-old very preterm-and full-term-born children. *Int Ophthalmol* 2019 Jul;39(7):1437-43. Doi: 10.1007/s10792-018-0959-2.
14. Sinha S, Sinha RK, Nishant P. Prevalence of spectacle use and amblyopia among young people presenting to a tertiary care institution of Bihar. *Trop J ophthal otolaryngol* 2019;4(2):151-6.
15. Barugel R, Touhami S, Samama S, Landre C, Busquet G, Vera L, et al. Evaluation of the Spot Vision Screener for children with limited access to ocular health care. *J Pediatr Ophthalmol Strabismus* 2019 Jun 1;23(3):153-e1. doi:10.1016/j.jaapos.2018.09.012.
16. Arshad MU, Zia S, Maqbool A, Bhatti RS, Iqbal Z, Iqbal Y. Frequency of Hyperopia in Children between 5 to 15 Years of Age. *Pakistan J Medical Health Sci* 2022 Apr 30;16(04):158
17. Han KE, Baek SH, Kim SH, Lim KH, Epidemiologic Survey Committee of the Korean Ophthalmological Society. Prevalence and risk factors of strabismus in children and adolescents in South Korea: Korea National Health and Nutrition Examination Survey, 2008-2011. *PLoS One*. 2018 Feb 14;13(2):e0191857. doi: 10.1371/journal.pone.0191857.
18. Prabhu AV, Thomas J, Ramesh SV, Biswas S. Performance of Plusoptix A09 photo screener in refractive error screening in school children aged between 5 and 15 years in the southern part of India. *J of Cur Ophthalmol* 2020 Jul;32(3):268. doi: 10.4103/JOCO.JOCO_76_20.
19. Mocanu V, Horhat R. Prevalence and risk factors of amblyopia among refractive errors in an Eastern European population. *Medicina* 2018 Mar 20;54(1):6. doi:10.3390/medicina54010006.
20. Akbarzadeh S, Vahabi R, Bazzazi N, Roshanaei G, Heydarian S, Fouladi DF. The burden of pure anisometropic amblyopia: a cross-sectional study on 2800 Iranians. *Int Ophthalmol* 2018 Feb;38(1):29-34. doi: 10.1007/s10792-017-0784-z.