Introduction

Refractive errors, is one of the most common vision disorders, are known as the second cause of visual impairment and low vision. Astigmatism is a clinically important condition and accounts for about 13% of the refractive errors of human eye. Its prevalence (±0.50 D) has been reported to vary with ethnicity, age, and sex. Regional and ethnic variation is also found in adult populations. Till now, prevalence rates up to 75% have been reported. The most common type of astigmatism orientation is with-the-rule (the axis of the minus cylinder is placed between 30° and 150°), and the most rare type is oblique astigmatism (axes between 30° and 60°). The prevalence of with-the-rule astigmatism (axes between 60° and 120°) usually decreases with age, and against-the-rule increases. The characteristic of astigmatism in fellow eyes has been assessed in some studies. They have shown that the amounts of astigmatism in fellow eyes are usually comparable, and significant anisoastigmatism is rare.

The pattern of the association of bilateral astigmatism axes in the general population and the changes of these patterns with age are not clear.

Purpose

- Investigated the bilateral similarity in the astigmatism axis orientation (rule similarity), direct and mirror symmetry of the axes, and the prevalence of each type of symmetry pattern.
- To provide a comprehensive report on the profile of bilateral astigmatism

Methods and Materials

This is a cross-sectional study carried out in Dr. Shroff’s Charity Eye Hospital, Daryaganj New Delhi (A Tertiary Eye Care Hospital). The subject population comprised of patients from age group 10 years and above.

- Inclusion criteria: Bilateral astigmatism not less than ± 0.50D in each eye.
- Exclusion: Conical disease, ocular trauma, any Ocular surgery, any anterior segment inflammation, infection, pterygium.
- A complete eye examination was carried out that included vision testing (Both aided and unaided tested with Snellen’s Chart, Number Chart or Broken C Chart), Refractometry (Heine Beta 200 retinoscope, HEINE, Germany) and Subjective refraction. The final subjective refraction was recorded in minus cylindrical form.

Result

Total of 1218 cases were analyzed. The mean age of the study population was 51 ± 18 years (10-96 years). Female 49% and male 51% (Fig 1).

Fig 2, The prevalence of Isorule in age group 10-59 years was 81.15% and in age group 60-99 years was 88.34%. On the other hand, the prevalence of Anisorule in age group 10-59 years was 18.85% and in age group 60-99 years was 11.66%. The p-value 0.001.

Fig 3: Rule similarity with relation to refractive error

Fig 4: Symmetry pattern with relation to refractive error

Fig 5: Isorule in relation to age

Fig 6: Rule Similarity with amount of astigmatism

Fig 7: Symmetry Pattern with respect to age

Conclusion

- Similar to the results of a previous clinical-based study, we found that the majority of cases of bilateral astigmatism in the population are isorule. Gender is not a determinant in the prevalence of isorule astigmatism, while age is associated with significant changes in its prevalence. Overall, the prevalence of isorule and anisorule astigmatism increases with age in the population, with the slope being much steeper in isorule astigmatism. The prevalence of isorule astigmatism increases with spherical ametropia. Axis symmetry is a common feature in bilateral astigmatism in the population, and the prevalence of direct symmetry is higher than mirror symmetry.

- Axis symmetry usually reduces at older ages, and the least symmetry is seen after the age of 50 years.

- Most cases of isorule astigmatism are with-the-rule (WW) and the majority of symmetric axes are also in this group, while the isorule oblique type is uncommon in the population and the cases show less symmetry. The rarest form of isorule astigmatism is oblique astigmatism with direct symmetry.

References