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A new and comprehensive look at bilateral astigmatism: Rule similarity and symmetry patterns of the astigmatism axes in fellow eyes

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Purpose: To investigate rule similarity (iso rule and aniso rule) and symmetry patterns (direct and mirror) in the astigmatism axes of fellow eyes in bilateral astigmatisms.

Methods: Refractive outcomes of 160608 subjects aged from 10 to 80 years old (mean 39.2±15.4) including 53.7% (86230) females were analyzed. Minimum astigmatism magnitude in both fellow eyes was considered 0.25 diopter (D).

Results: The prevalence of iso rule bilateral astigmatism was 82.9%. Mean aniso-astigmatism was 0.31±0.4D and 85.2% of our subjects had lowered than 0.50 D cylindrical anisometropia. The median values of absolute difference in the axes of the fellow eyes were 10 and 20 degrees under the mirror and direct symmetry models, respectively. 68% in mirror model and 47.1% in direct model were within 15 degrees of exact symmetry point. The symmetry patterns did not show any significant difference between various magnitudes of spherical ametropia. The astigmatisms with higher magnitudes were shown stronger symmetries than the lower astigmatisms.

Conclusion: According to our findings, the majority of bilateral astigmatisms are iso rule. This rule similarity becomes less prevalent with increasing age. The iso rule pattern is more common in individuals having higher magnitudes spherical ametropia. Both mirror and direct symmetry are common in the astigmatism axes of fellow eyes and the mirror pattern is predominant. Both of symmetry models are stronger in the higher magnitudes of bilateral astigmatisms.

Biography

Amir Asharlous is a PhD candidate in Optometry and Vision Science at Mashhad University of Medical Sciences. He is a Professor at Optometry department of Iran University of Medical Sciences. He has completed more than 10 research programs and has published more than 6 papers in reputed journals of Optometry and Ophthalmology.

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