Comparison of Visual Field Fluctuation Between Myopic and Emmetropic Glaucoma Patients

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Background: Conflicting epidemiologic studies suggest that myopia may both increase and decrease the risk of glaucomatous visual field loss. To provide appropriate treatment to glaucoma patients, it is important to detect meaningful changes in the visual field, which requires distinguishing between visual field fluctuation and progression. Visual field fluctuation is defined as the variability between two visual field tests performed on separate days or months on the same eye that cannot be attributed to a pathologic change. We hypothesize that glaucoma patients with myopia will demonstrate more visual field fluctuation compared to emmetropic patients.

Methods: Four or more 24-2 or 30-2 Humphrey visual field tests over several visits will be analyzed per patient. Data including the VFI plot, mean deviation, and threshold sensitivity on the glaucoma progression analysis will be collected to measure fluctuation. The sample is divided into two groups: 1. emmetropic glaucoma patients with a spherical equivalent refraction between +2 to -2 diopters and 2. high myopic glaucoma patients with a spherical equivalent refraction over -5 diopters. Bland-Altman plots, Mann-Whitney U tests, Root Mean Square Error (RMSE), intraclass correlation coefficients, and generalized estimating equation models for ordinal data will be used to analyze the collected data.

Results: Thus far, 2,979 charts have been reviewed with data collected from 27 emmetropes and myopes who met the inclusion criteria. The recruitment goal is 78 per group and 156 total. Preliminary results for RMSE found a statistically significant p-value for mean deviation (0.0320), and no statistically significant difference for threshold sensitivity (0.5179) and VFI (0.0904).

Conclusion and Potential Impact: This ongoing study will help establish if glaucoma patients with high myopia demonstrate greater visual field fluctuation. It is important for clinicians to have this information so that these patients can be examined carefully to prevent misdiagnoses or delayed glaucoma treatment.