Binocular Measures of Visual Function versus Monocular-based Approximations

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PurS PurPOSE
To assess the relationship between binocular visual function measures and monocular approximations, with data from the Collaborative Initial Glaucoma Treatment Study (CIGTS).

Methods
- 607 participants with glaucoma
- Monocular measures of visual function collected at baseline and follow-up included the mean deviation (MD) and visual acuity (VA)
- Binocular measures were added to the CIGTS 3 years into the study, including the Esternan visual field test and the binocular VA test

Table 1. Monocular-based approximations of binocular visual field and true binocular measures at the 5 year cross-section

Table 2. Descriptive statistics of the 575 CIGTS subjects with binocular measures

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Results
- In 7 of 9 VAQ scales, correlations between the VAQ and Esternan VF score were larger (r=0.14 to 0.25, all p<0.05) than correlations with all 7 monocular approximations.
- Binocular VA showed larger correlations with monocular approximations than correlations with all 7 monocular approximations.

Figure 1. Correlations between binocular VF/VA and monocular approximations

Figure 2a. Plot of binocular VF by average eye VA

Figure 2b. Plot of Esternan VF by average eye VA

Figure 3a. Correlation of VAQ scales with monocular and binocular VA

Figure 3b. Correlation of VAQ scales with monocular and binocular VF

Conclusions
- Binocular VA was well estimated by monocular-based approximations
- Esternan binocular VF was weakly estimated by monocular-based approximations
- A ceiling effect in the Esternan VF score contributed to poor agreement with monocular approximations of binocular VF
- Correlations of VA and VF with the VAQ were modest (r<0.25).

In contrast, true binocular VF (Esternan) correlated better with the VAQ than monocular approximations

Implications for Practice
- For VA, there is little added benefit to performing binocular VA because it is highly correlated with monocular approximations and less correlated with QOL.
- For VF, there is benefit to performing the Esternan because it correlates better with QOL. However, a modification to distinguish modest field losses is needed.

Grant Support
- National Eye Institute

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# 5596 - D0101

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