Esterman Virtual Reality Visual Fields in Patients with Glaucoma.

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Purpose: Visual field damage has been shown to be related to impaired driving performance. The Esterman visual field test, traditionally performed using standard automated perimetry (SAP), is a method to detect visual field deficits that would affect driving performance. The purpose of this study is to compare Esterman visual field test results using standard automated perimetry (SAP) to results obtained from a virtual reality visual field headset (VRVF).

Methods: Patients with mild to severe glaucoma ranging from 14 to 90 years were included. Subjects performed Esterman visual field tests on both VRVF and SAP. Order of testing was randomized. Duration of testing and the Esterman efficiency score (EES), defined as the number of points correctly identified divided by the number of total points displayed during the test, were recorded for each test.

Results: 22 subjects were included in the study with ages ranging from 14-78 years old. Eleven had mild glaucoma and 11 had moderate to severe glaucoma. Mean Esterman efficiency score (EES) using SAP was 85 and mean EES using VRVF was 76. Mean duration of SAP testing was 281 seconds while mean duration of VRVF testing was 299 seconds. Patients reported a more pleasant experience with the head mounted VRVF device.

Conclusion: Glaucoma has been found to be a leading reason for driver's license issues at a higher age. The Esterman visual field test performed using standard automated perimetry (SAP) can be useful in driver's license screenings; however, lack of portability and inability to accommodate multiple patients at once in current testing environments creates challenges of using SAP to implement the Esterman test. Virtual reality visual field devices can be used in clinical practice to provide comparable results to standard automated perimetry for the Esterman visual field test, offering a portable and virtual alternative to SAP.