Acceptance, Tolerability and Patient Comfort during Home-Based Visual Field Testing using a Virtual Reality Headset

GENEVE OPHTALMOLOGIE

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INTRODUCTION

Visual field testing is key to assessing functional loss in glaucoma. Despite its clinical value, traditional visual field testing has a number of limitations, including its dependency on medical equipment and posturing requirements.[1]

Figure 1 – Traditional visual field testing and posturing.

AIM

The present study examines the acceptance, tolerability and comfort of home-based visual field testing using a virtual reality (VR) headset.

METHOD

Healthy subjects were prospectively enrolled to undergo visual field examination in a non-clinical setting using a commercially available stereoscopic VR headsets and a sequentially optimized reconstruction strategy (SORS).[2]
Subjects were supervised and wore their own spectacles within the headset. After the test, they were asked about their comfort, side effects, and readiness to repeat the examination at home.

RESULTS

- **Cohort:** Of the 12 subjects enrolled, 7 were female (58.3%). Mean age was 45 years (range: 30-68). While none of the subject suffered from glaucoma, their medical histories included severe arthritis, refractive surgery, high myopia, amblyopia and esotropia.
- **Comfort:** Mean self-reported comfort score was 8.75 out of 10 (range: 8-10), with some subjects taking the test in dorsal decubitus position. The mean perceived duration of the test (187 seconds) correlated strongly with the mean actual duration (166 seconds; r = 0.76). In all, 58.3% of perceived durations were shorter than actual test durations.
- **Acceptance:** Eleven subjects (91.7%) considered the device was easy to use, and 100% responded they would accept to repeat the test at home, of which 41.7% stated they would prefer to be supervised.
- **Tolerability:** Overall, 3 subjects reported mild side-effects: light asthenopia, epiphora and periocular flushing. All side effects were mild and self-limited.
- **Reliability measures:** False negative and false positive responses were 3.75% and 4.7% respectively. Central fixation recorded by real-time eye tracking was maintained on average 73.23% of the time and showed a strong correlation with false negative responses (r = 0.75).

Figure 2 – Perivision VR headset and controller (top left), illustration of patient interface during testing (bottom left), and a patient adopting natural body posture during visual field testing (right).

CONCLUSIONS

While the present study did not examine the test algorithm itself, it suggests that home-based visual field testing using a VR headset is well tolerated and accepted, with high levels of self-reported comfort and only mild side effects. While all subjects welcomed the opportunity to perform clinical tests from home, over a third expressed a preference for supervision. Real-time eye tracking correlated well with traditional reliability markers, suggesting potential clinical value.

REFERENCES

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