Clinical evaluation of Swedish Interactive Thresholding Algorithm-Faster Compared with Swedish Interactive Thresholding Algorithm-Standard in normal subjects, glaucoma suspects, and patients with Glaucoma

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Purpose

Glaucoma is a leading cause of irreversible blindness. Clinically, visual function is typically assessed using static white on white perimetry - the Humphrey Field Analyzer (HFA). The full threshold strategy of the HFA produces accurate results but takes nearly 12 minutes per eye. These long durations result in reduced reliability of this testing strategy. To overcome this limitation, faster algorithms- Swedish Interactive Thresholding Algorithm (SITA)- Standard (SS), Fast (SF) and Faster (SFR) were introduced with adaptable interstimulus interval for each patient and shorter time for threshold testing. These algorithms have better compliance but could also reduce test reliability. The aim of this study was to compare the performance of SFR and SS test strategies in normal subjects, glaucoma suspects and glaucoma patients.

Methods

364 subjects (77 normal subjects, 178 glaucoma suspects, 109 glaucoma patients) with previous experience of perimetry testing using 24-2 test grid of SS and SFR test strategies were randomized for each subject and performed in the same clinical visit. Test reliability and the cumulative test duration of SS and SFR test strategies were evaluated. Pointwise and cluster analysis was performed to find systematic differences between the algorithms.

Results

There were a greater number of SFR tests which were unreliable (29.3%) compared to the SS strategy (7.7%, \(P < .0001\)). The main source of unreliability was false positive and seeding point errors. Duration of testing for reliable fields were shorter for SFR compared to SS in all three groups (median difference = 182 seconds, IQR 161-207.3 seconds). SFR showed higher sensitivity values particularly when visual field loss was <19dB. Cluster analysis showed no systematic pattern of defects in both the test strategies.

Conclusion

Improving speed and reliability of visual field testing is essential as clinical practice guidelines suggest often and repeated testing of visual function in glaucoma patients. Overall, SFR takes a shorter time compared to SS but is not as reliable. Reliability could be improved by careful patient instructions and improving testing of seeding points. This study also indicates lack of interchangeability of algorithms for long-term monitoring of patients.