Visual Field Change and 24-Hour IOP-Related Profile with a Contact Lens Sensor in Treated Glaucoma Patients


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PURPOSE
To test the hypothesis that a 24-hour recording of intraocular pressure (IOP)-related measurements derived from a contact lens sensor (CLS) correlates to the rate of visual field progression in treated glaucomatous eyes.

DESIGN
Prospective, cross-sectional study.

PARTICIPANTS
Forty treated glaucomatous patients with 8 or more 24-2 visual field tests.

METHODS
Twenty-four–hour recording with a CLS that provides IOP-related measurements.

MAIN OUTCOME MEASURES
Rates of visual field mean deviation (MD) change before and at the time of CLS recording and CLS parameters, namely number of large peaks, mean peak ratio, wake-to-sleep slope, amplitude and area under the cosine curve, and variability from the mean.

RESULTS
When comparing the rate of MD change before and at the time of CLS recording of all patients, the average slope was \(-0.05\) dB/year faster in the beginning compared with the end \((P = 0.087)\), suggesting a deceleration of progression by the time of CLS recording. The number of long peaks and the mean peak ratio when patients were awake were the best predictors of faster progression. The combination of CLS parameters provided better measures of goodness of fit than Goldmann IOP parameters (mean, peak, and fluctuation) in the same period.

CONCLUSIONS
Intraocular pressure-related parameters obtained with 24-hour recording with a CLS were associated with the rate of visual field progression in treated glaucomatous eyes. This technology may be useful in detecting eyes at higher risk of glaucoma progression while receiving treatment.