# Validation of Rates of Mean Deviation Change as Clinically Relevant End Points for Glaucoma Progression

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PURPOSE: To investigate whether rates of standard automated perimetry (SAP) mean deviation (MD) over an initial 2-year follow-up period were predictive of events of visual field progression over an extended follow-up.

DESIGN: Longitudinal, prospective, observational study.

PARTICIPANTS: Two hundred forty-six eyes of 168 patients with glaucoma followed up every 6 months for up to 5 years.

METHODS: Patients were required to have a minimum of 5 reliable SAP tests during the first 2 years of follow-up. Events of progression were evaluated using 2 methods: Guided Progression Analysis (GPA; Carl Zeiss Meditec, Inc) and a United States Food and Drug Administration (FDA) -suggested end point. The date of the first test showing progression after the first 2 years was considered to be the event date. Rates of change in SAP MD were calculated for the first 2 years of follow-up, and joint longitudinal survival models were used to assess the risk of faster initial MD loss for subsequent progression based on each event analysis.

MAIN OUTCOME MEASURE: Risk of having an event of progression based on initial rates of SAP MD change.

RESULTS: Fifty-six eyes (22.8%) showed an event of progression by the GPA and 51 eyes (20.7%) did so by the FDA end point. Each 0.1-dB/year faster rate of SAP MD loss in the first 2 years was associated with a 26% increase in risk of a GPA progression end point developing (R2 = 76%) and 32% risk of an FDA-based end point developing (R2 = 83%) . A reduction of 30% in the rate of MD change in the first 2 years was associated with a 20% reduction in the cumulative probability of a progression event developing over 5 years of follow-up.

CONCLUSIONS: Rates of SAP MD change for eyes with glaucoma calculated over the initial 2 years of follow-up were strongly predictive of events of progression over subsequent follow-up. Our findings give support for the use of slopes of MD change as suitable end points of progression in clinical trials.


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