

Intraocular Pressure Control and Long-term Visual Field Loss in the Collaborative Initial Glaucoma Treatment Study

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OBJECTIVE: To evaluate the impact of measures of intraocular pressure (IOP) control on progression of visual field (VF) loss during long-term treatment for open-angle glaucoma (OAG) .

DESIGN: Longitudinal, randomized clinical trial.

PARTICIPANTS: We included 607 participants with newly diagnosed OAG.

METHODS: Study participants were randomly assigned to initial treatment with medications or trabeculectomy, and underwent examination at 6-month intervals. Standardized testing included Goldmann applanation tonometry and Humphrey 24-2 full threshold VFs. Summary measures of IOP control during follow-up included the maximum, mean, standard deviation (SD) , range, proportion less than 16, 18, 20, or 22 mmHg, and whether all IOP values were less than each of these 4 cutpoints. Predictive models for VF outcomes were based on the mean deviation (MD) from VF testing, and were adjusted for age, gender, race, baseline VF loss, treatment, and time. Each summary IOP measure was included as a cumulative, time-dependent variable, and its association with subsequent VF loss was assessed from 3 to 9 years postrandomization. Both linear mixed models, to detect shifts in MD levels, and logistic models, to detect elevated odds of substantial worsening (>3 dB) , were used.

MAIN OUTCOME MEASURES: We measured the MD from Humphrey 24-2 full threshold VF tests.

RESULTS: The effect of the summary IOP measures differed between the medicine and surgery groups in models that addressed the continuous MD outcome. After adjustment for baseline risk factors, in the medicine group larger values of 3 IOP control measures-maximum IOP (P = 0.0003) , SD of IOP (P = 0.0056) , and range of IOP (P=0.0003) were associated with greater VF loss. **CONCLUSIONS:** These results support considering more aggressive treatment when undue elevation or variation in IOP measures is observed.

FINANCIAL DISCLOSURE(S) : Proprietary or commercial disclosure may be found after the references.

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