

The Utility of iCare HOME Tonometry for Detection of Therapy-Related Intraocular Pressure Changes in Glaucoma and Ocular Hypertension

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Background: Intraocular pressure (IOP) is the main modifiable risk factor in the management of patients with glaucomatous optic neuropathy,¹ one of leading causes of vision loss in developed countries.² Currently, patients with glaucoma receive IOP measurements 2-4 times per year during standard-of-care clinic appointments. These limited readings often fail to detect the peak IOP and may not reflect patients' true mean IOP, as emerging research has demonstrated IOP variation both within and across days.^{1,3} Our study assesses how the iCare HOME, an FDA-approved rebound tonometer⁴ which patients can use to self-measure IOP at home, may be used to more completely assess IOP and monitor therapy-related IOP changes.

Subjects, Participants, and/or Controls: 43 eyes (n=27 subjects) with open angle glaucoma or ocular hypertension were enrolled during standard-of-care clinic visits. Participants were grouped into control eyes managed on stable therapy (n=18 eyes), or therapy change eyes undergoing selective laser trabeculoplasty (SLT, n=8 eyes), initiating topical therapy (n=8 eyes), or adding a second medication to existing monotherapy (n=9 eyes).

Methods: Subjects recorded IOP four times daily (before breakfast, before lunch, before dinner, before bed) for one week using iCare HOME tonometry. Upon tonometer return, subjects underwent SLT or new medication start; an additional week of iCare HOME measurements was collected after 4-6 weeks. Control subjects recorded an additional week of measurements after six weeks. Measurements were grouped into four time periods (5-10am, 10am-3pm, 3-5pm, 8pm-1am). Goldmann applanation tonometry (GAT) was performed at each study visit for comparison. Detection of therapy response was defined as an IOP reduction of $\geq 20\%$.

Results: For eyes which demonstrated a therapy response by GAT (n=11), iCare HOME detected a therapy response in 90.9% of eyes in ≥ 1 time period and 45.5% of eyes in all four time periods. In eyes without a GAT-measured therapy response (n=14), iCare HOME detected a response for 71.4% (n=10) of eyes in ≥ 1 time period and for 7.1% of eyes (n=1) at all four time periods. In treatment eyes, intraday and interday average minimum and maximum IOP, as well as interday IOP range, were significantly reduced after therapy without a significant change in intraday IOP range. Control group eyes did not demonstrate a significant change in average IOP minimum, maximum, or range between study weeks.

Conclusions: Home tonometry with iCare HOME reliably detects therapy-related IOP changes in patients with glaucoma and ocular hypertension. Treatment responses correlated well with in-office GAT and may detect treatment responses missed by GAT. IOP measurements via home tonometry provide additional clinical information regarding intraday and interday IOP fluctuation beyond standard of care, in office GAT measurements. The iCare HOME is a valuable tool to monitor therapeutic efficacy in patients with glaucoma.

References

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