OPEN ACCESS
ARVO Annual Meeting Abstract | June 2023

Effects of combined changes in Intra-Ocular Pressure and Blood Pressure on Glaucoma progression

Rajat Rai; Giovanna Guidoboni; Christopher Wikle; Alice Verticchio; Brent A Siesky; Alon Harris; Gal Antman

— Author Affiliations & Notes

Rajat Rai
Electrical Engineering and Computer Science, University of Missouri System, Columbia, Missouri, United States

Giovanna Guidoboni
Electrical Engineering and Computer Science, University of Missouri System, Columbia, Missouri, United States

Christopher Wikle
Statistics, University of Missouri System, Columbia, Missouri, United States

Alice Verticchio
Opthalmology, Icahn School of Medicine at Mount Sinai, New York, New York, United States

Brent A Siesky
Opthalmology, Icahn School of Medicine at Mount Sinai, New York, New York, United States

Alon Harris
Opthalmology, Icahn School of Medicine at Mount Sinai, New York, New York, United States

Gal Antman
Opthalmology, Icahn School of Medicine at Mount Sinai, New York, New York, United States
Opthalmology, Rabin Medical Center, Petah Tikva, Central, Israel

Footnotes

Commercial Relationships **Rajat Rai** None; **Giovanna Guidoboni** Foresite HealthCare LLC, Code C (Consultant/Contractor), Gspace LLC, Code I (Personal Financial Interest); **Christopher Wikle** None; **Alice Verticchio** None; **Brent Siesky** None; **Alon Harris** AdOM, Luseed, Qlaris, Cipla, Code C (Consultant/Contractor), AdOM, Luseed, Oxymap, Qlaris, Phileas Pharma, SlitLed, QuLent, Code I (Personal Financial Interest), AdOM, Qlaris, Phileas Pharma, Code S (non-remunerative); **Gal Antman** None

Support NIH grant R01EY030851, NHS DMS 1853222/2021192, NYEE Foundation grants; in part by a Challenge Grant award from Research to Prevent Blindness, NY

Investigative Ophthalmology & Visual Science June 2023, Vol.64, 4345. doi:

Abstract

Purpose : Lowering intraocular pressure (IOP) is currently the only approved therapeutic approach for the medical management of open angle glaucoma (OAG). In addition to IOP, several studies have

associated both high (hypertension) and low (hypotension) blood pressure (BP) with OAG. Here, eyes with OAG from the Indianapolis Glaucoma Progression Study (IGPS) are categorized based on changes in IOP-BP combinations and analyzed for OAG progression over four years.

Methods : 56 eyes with OAG in the IGPS study were divided into four groups based on the changes in IOP and mean arterial pressure (MAP) between the first and fourth year visits: (I) both IOP and MAP decreased (12 eyes); (II) IOP decreased, while MAP increased (12 eyes); (III) IOP increased (19 eyes); and (IV) no change in IOP (13 eyes). The four groups were then analyzed for differences in clinical markers between Year 1 and Year 4 using a Wilcoxon signed-rank test (Table 1). The markers included the peak-systolic and end-diastolic velocities (PSV, EDV) in the central retinal artery (CRA) assessed via color Doppler imaging; percentage of zero-flow pixels in the superior (zero-sup) and inferior (zero-inf) regions of the Optic Nerve Head (ONH) via Heidelberg Retinal Flowmetry; the cup-to-disk area ratio (C/D ratio) and the average thickness of the retinal

nerve fiber layer (RNFL avg) as measured via ocular coherence tomography (OCT). Differences in markers were also analyzed across the entire dataset using a Kruskal-Wallis test, with each of the groups as factors (Table 2).

Results : The Wilcoxon signed-rank test showed statistically significant differences in markers between Year 1 and Year 4 among each of the groups. Zero-inf increased significantly for eyes in group I and III and the C/D ratio increased significantly for eyes in group II. Likewise, RNFL avg decreased significantly for eyes in group I. Clinical markers did not show any statistical significance difference for the eyes in group (IV). The Kruskal-Wallis test results were not statistically significant (Table 2), suggesting that there is no one sample that stochastically dominates over other samples.

Conclusions : The results of our study suggest a combined and interconnected model of risk using IOP-MAP may be important for predicting OAG progression.

If confirmed, a combined approach to modulations of IOP and MAP could be beneficial in lowering risk in eyes with OAG.

This abstract was presented at the 2023 ARVO Annual Meeting, held in New Orleans, LA, April 23-27, 2023.

-

View Original Download Slide

-

View Original Download Slide