

Ophthalmology Times

Research Scholar

Honoree Program

The real world effect of anti-VEGF injections on IOP

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FINANCIAL DISCLOSURES:

Cynthia Mattox is a consultant for Allergan, Aerie, and Alcon and receives financial support from Allergan and Alcon

Mathew MacCumber received financial support from Alimera, Clearside, Regeneron and Genentech



MY ROLE IN THIS RESEARCH:

- Conception and design of the project
- Analysis and interpretation of data
- Creation of the presentation



Background

Anti-VEGF intravitreal injections have been linked to sustained clinically significant IOP rise in clinical trials

- 23% at 2 years - MARINA and ANCHOR
- 10% at 3 years - DRCR Protocol I
- 4% and 8% at 1.8 years - VIEW 1 & 2

Bakri SJ, Moshfeghi DM, Francom S, et al. Intraocular pressure in eyes receiving monthly ranibizumab in 2 pivotal age-related macular degeneration clinical trials. *Ophthalmology* 2014;121:1102-8

Bressler SB, Almkhatar T, Bhorade A, et al. Repeated intravitreal ranibizumab injections for diabetic macular edema and the risk of sustained elevation of intraocular pressure or the need for ocular hypotensive treatment. *JAMA Ophthalmology* 2015;133:589-97.

Freund KB, Hoang QV, Saroj N, et al. Intraocular pressure in patients with neovascular age-related macular degeneration receiving intravitreal aflibercept or ranibizumab. *Ophthalmology* 2015;122(9):1802-10.



Background

- American Academy of Ophthalmology's IRIS registry® (Intelligent Research In Sight) is the largest ophthalmic registry covering 11% of US population
- 2.4 million anti-VEGF injections included in 2016 alone



Objective

To determine the real world effect of anti-VEGF intravitreal injections on IOP using comparison to untreated, fellow eyes.



Methods

Inclusion:

- anti-VEGF injection in right eye during study period

Exclusion:

- > 1 type of anti-VEGF
- intravitreal steroid
- intravitreal injections in fellow eye
- < 1 year of follow-up

Primary outcomes

- IOP change from baseline
- Proportion with a clinically significant IOP rise
 - Increase ≥ 6 mmHg with IOP >21 (as used in other studies)



Subsets

Group

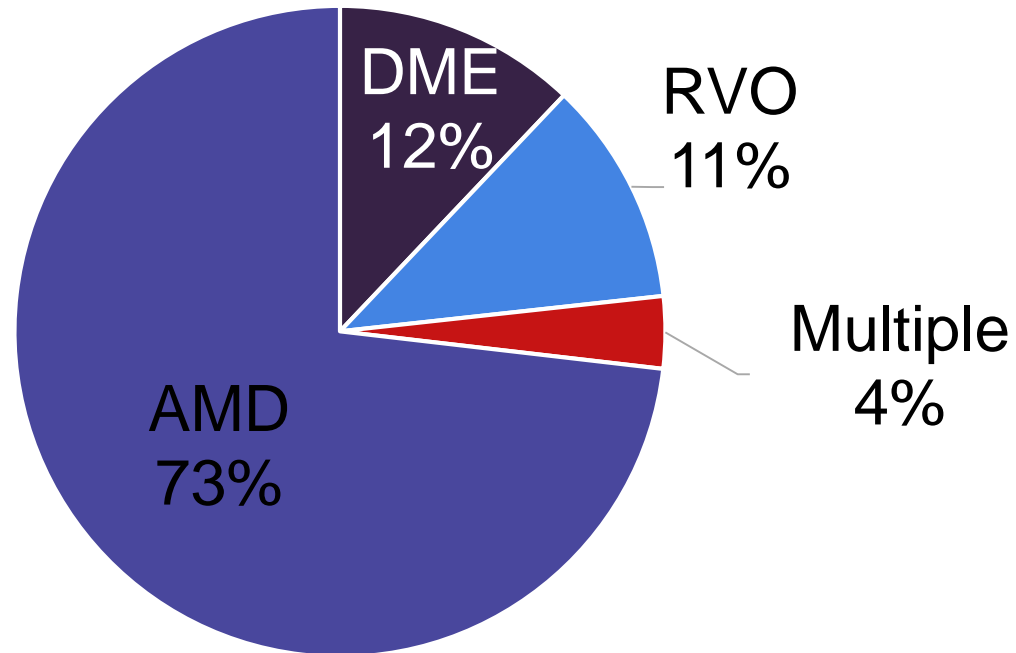
- AMD: AMD diagnosis only
- New: Treatment naïve

Drug

- Aflibercept
- Bevacizumab
- Ranibizumab

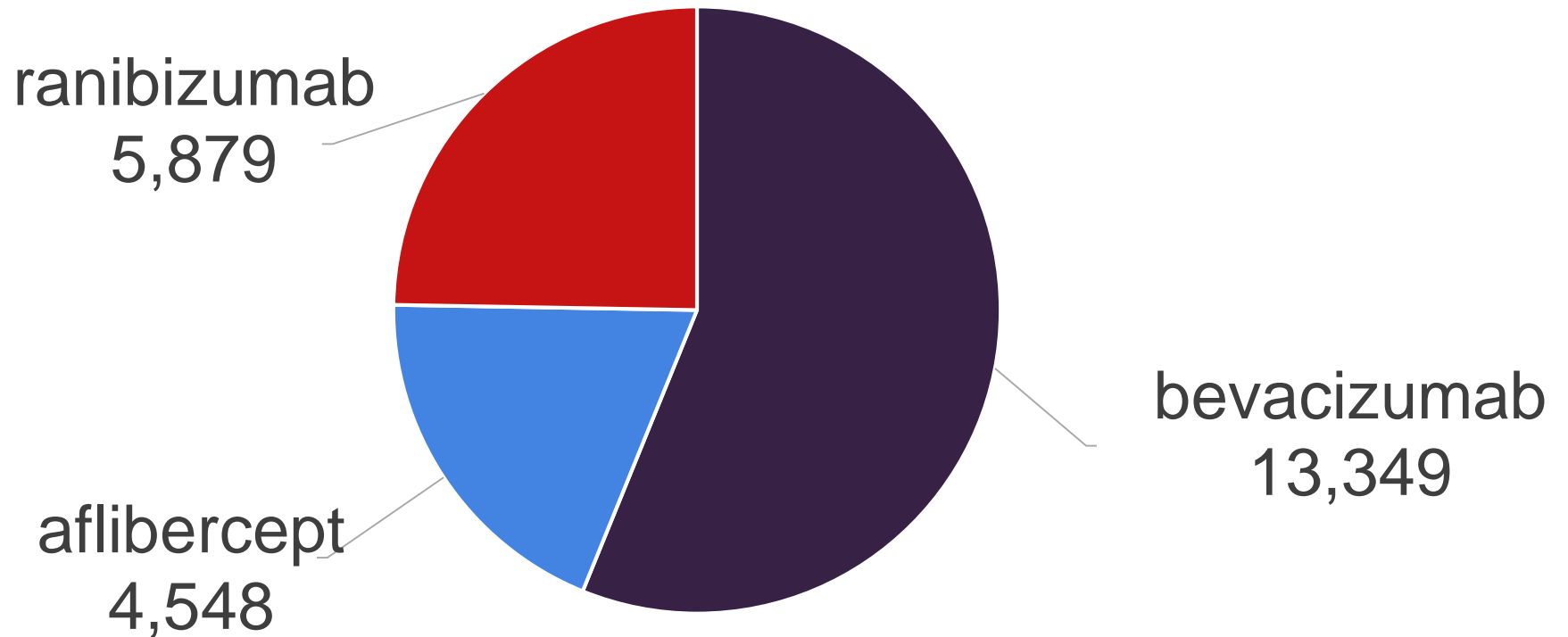


Patients by diagnosis





Patients by drug





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Baseline and diagnosis

- 14,333 females, 9,443 males
- Average age 77



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Average follow up time (days)

	All	AMD	New
all drugs	678	687	635
aflibercept	665	676	618
ranibizumab	692	700	649
bevacizumab	676	686	634

~1.75 years



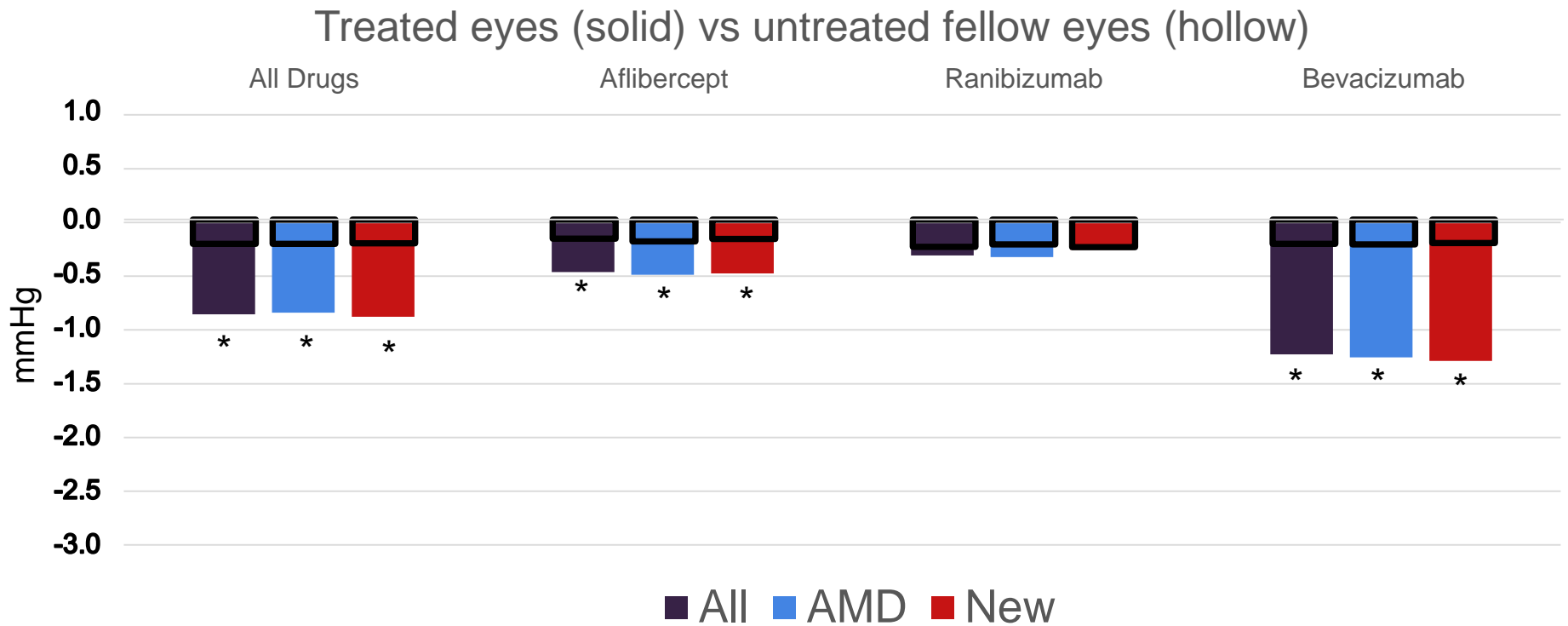
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Mean Number of Injections

	All	AMD	New
all drugs	7.9	8.5	7.4
aflibercept	9.3	9.4	8.6
ranibizumab	9.0	9.5	8.6
bevacizumab	6.9	7.6	6.4



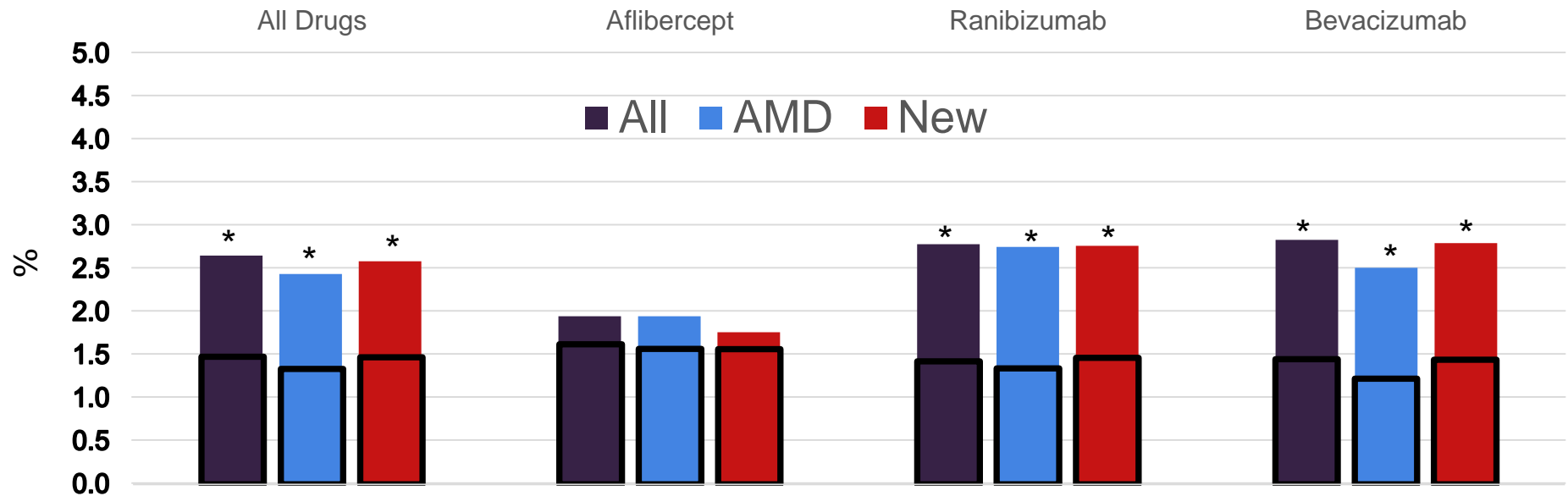
Change in IOP from baseline



* Indicates statistically significant difference between treated and untreated eyes

Rate of clinically significant IOP increase

Treated eyes (solid) vs untreated fellow eyes (hollow)



* Indicates statistically significant difference between treated and untreated eyes



Percent undergoing glaucoma procedures

Procedure Type	Treated Eyes	Untreated Eyes
Laser trabeculoplasty	0.6%	0.4%
Aqueous shunt	0.1%	<0.1%
Ciliary body destruction	0.1%	0.1%
Trabeculectomy	<0.1%	<0.1%
Express shunt	<0.1%	<0.1%



Comparison to previous studies

Rates of clinically significant IOP elevation lower than for clinical trials

- 23% (vs 14% control) in MARINA and ANCHOR for ranibizumab at 2 years
- 10% (vs 3% control) in DRCR for ranibizumab at 3 years
- 8% ranibizumab and 4% aflibercept at 1.8 years in VIEW studies
- **2.6% (vs 1.5% control) in our real world dataset at 1.8 years**



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Conclusions

- Bevacizumab and aflibercept intravitreal associated with a small statistically significant but not clinically significant decrease in IOP over time
- A clinically significant IOP elevation occurred for bevacizumab and ranibizumab in a small percentage of eyes, but not for aflibercept



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Thank you

Mathew MacCumber, MD, PhD

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