Clinical Outcomes of Eyes with Neovascular Glaucoma Treated with Intravitreal Anti-Vascular Endothelial Growth Factor Injections

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Purpose:
To determine patient characteristics that predict worse clinical outcomes in eyes with neovascular glaucoma (NVG) despite intravitreal anti-vascular endothelial growth factor (VEGF) therapy.

Methods:
A retrospective chart review was performed of patients with NVG who were treated with intravitreal anti-VEGF therapy from 9/8/11 to 5/8/20 at Wills Eye Hospital and the offices of Mid Atlantic Retina. Patients were excluded if they had <6 months follow-up, NLP vision at presentation, or glaucoma surgery prior to presentation. Markers predicting progression of NVG were assessed. The primary outcome variable was glaucoma progression, defined as having glaucoma surgery or developing NLP vision within 6 months of initial diagnosis. Clinical markers predicting progression of NVG were assessed using a multivariate logistic regression model to perform a backwards step-wise variable selection. All statistical analyses were conducted using SPSS, Version 26 (SPSS, Inc., Chicago, IL, USA).

Results:
Of the 259 included eyes, the major causes of NVG were proliferative diabetic retinopathy (PDR, 54%), retinal vein occlusion (27%), and retinal artery occlusion (9%). Mean (±SD) patient age was 67 ± 15 years, and 43% were female. Mean IOP at presentation was 30.5 ± 12.9 and mean logMAR visual acuity was 1.6 (Snellen ~20/800). Progression of glaucoma was observed in 34% of included eyes by 6 months. Multivariate analysis revealed that at initial presentation of NVG, being on 2 or more glaucoma medications (p<0.001, OR: 3.83), being on a systemic glaucoma medication (p=0.035, OR: 3.71), IOP > 35 mmHg (p<0.001, OR: 3.13), or complaints of pain or discomfort (p=0.038, OR: 1.93) were associated with glaucoma progression. PDR (p=0.004, OR: 3.01) and a multifactorial cause for NVG (p=0.026, OR: 6.27) were also associated with progression.

Conclusions:
Patients with 2 or more glaucoma medications, a systemic glaucoma medication, presenting IOP > 35 mmHg, or complaints of pain or discomfort at the initial presentation to a retina specialist with NVG were strongly associated with progression to glaucoma surgery or NLP vision despite anti-VEGF therapy. PDR and multifactorial causes of NVG were also associated with progression. Prompt referral to a glaucoma specialist for patients with these presenting characteristics may be critical.