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

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Disclosures

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Summary

• Role of anti-VEGF injections in managing neovascular glaucoma is unclear
• Some patients still have uncontrolled IOP despite this treatment while others improve
• Factors at time of initial NVG presentation to a retina specialist associated with glaucoma progression despite anti-VEGF therapy:
  • 2 or more glaucoma medications
  • Any systemic glaucoma medication
  • IOP >35
  • HM or worse vision
• Prompt referral to a glaucoma specialist especially for patients with these presenting features may be warranted
Neovascular Glaucoma (NVG)

• Result of iris and angle neovascularization
• Multiple etiologies: PDR, CRVO, CRAO
• Patients often have concomitant causes for decreasing visual acuity
Therapy for NVG

• NVG therapy is goal directed
  • Decrease IOP to safe levels → preservation of vision
  • Comfort measures if poor vision potential

• Treatment for NVG:
  • IOP lowering eye drops or systemic medication
  • Anti-VEGF injection
  • Panretinal photocoagulation (PRP)
  • Glaucoma surgery
Anti-VEGF injections for new NVG patients

- Efficacy of anti-VEGF injections well established for neovascular pathologies
- Some patients with NVG still have uncontrolled IOP despite anti-VEGF treatment

- What presenting features predict which patients will experience glaucoma progression despite receiving anti-VEGF injections for NVG?
Purpose

• To determine patient characteristics that predict worse clinical outcomes in eyes with neovascular glaucoma (NVG) that have received intravitreal anti-vascular endothelial growth factor (VEGF) therapy
Methods

- Retrospective cohort study of 237 eyes
- Wills Eye Hospital and offices of Mid Atlantic Retina, 9/8/11 to 5/8/20

Inclusion criteria:
- Diagnosis of NVG
- $\geq 1$ anti-VEGF injection within 2 months of diagnosis

Exclusion criteria:
- < 6 months of follow up (unless patient reached endpoint before 6 months)
- Prior glaucoma surgery
- NLP vision at initial diagnosis visit
- Injection received after endpoint occurred
Data Collected

- **Etiology**: PDR, CRVO, CRAO or Other
- **Presenting characteristics**: Age, gender, VA, IOP, complaints of discomfort, medications, lens status, cup to disc ratio
- **Follow-up data**: VA, IOP, anti-VEGF and PRP treatment(s), glaucoma medications (eye drops and systemic)
- **Endpoint**: “Glaucoma progression” = incisional glaucoma surgery or progression to NLP vision within 6 months
## Results: Baseline Characteristics

<table>
<thead>
<tr>
<th>Patient characteristic</th>
<th>Number of patients (%)</th>
</tr>
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<tbody>
<tr>
<td>Female</td>
<td>102 (43%)</td>
</tr>
<tr>
<td><strong>Etiology of NVG</strong></td>
<td></td>
</tr>
<tr>
<td>PDR</td>
<td>125 (53%)</td>
</tr>
<tr>
<td>RVO</td>
<td>68 (29%)</td>
</tr>
<tr>
<td>RAO</td>
<td>23 (9%)</td>
</tr>
<tr>
<td>Other</td>
<td>21 (9%)</td>
</tr>
<tr>
<td>Received glaucoma surgery</td>
<td>65 (27%)</td>
</tr>
<tr>
<td>Progression of glaucoma</td>
<td>85 (36%)</td>
</tr>
</tbody>
</table>

### First NVG visit data

<table>
<thead>
<tr>
<th></th>
<th>67 (15) years</th>
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<tbody>
<tr>
<td>Age (SD)</td>
<td></td>
</tr>
<tr>
<td>Paracentesis</td>
<td>55 (23%)</td>
</tr>
<tr>
<td>Gonioscopy</td>
<td>58 (24%)</td>
</tr>
<tr>
<td>1 or more glaucoma medications</td>
<td>155 (65%)</td>
</tr>
<tr>
<td>Systemic glaucoma medication</td>
<td>23 (10%)</td>
</tr>
<tr>
<td>IOP elevated &gt;20 mmHg</td>
<td>184 (78%)</td>
</tr>
<tr>
<td>Discomfort noted in affected eye</td>
<td>88 (37%)</td>
</tr>
<tr>
<td>Median glaucoma medications</td>
<td>1 medication</td>
</tr>
<tr>
<td>Mean IOP (SD)</td>
<td>30.9 (12.5) mmHg</td>
</tr>
<tr>
<td>Mean logMAR VA affected eye (Snellen equivalent)</td>
<td>1.681 (~20/1000)</td>
</tr>
<tr>
<td>Mean logMAR VA fellow eye (Snellen equivalent)</td>
<td>0.564 (~20/80)</td>
</tr>
</tbody>
</table>
Results: Multivariate Analysis

- Presenting factors independently associated with progression to glaucoma surgery or NLP vision by 6 months:
  - 2 or more previously prescribed glaucoma medications
    - (OR = 2.66, p=0.003, 95% CI = 1.410 - 5.025)
  - Previously prescribed systemic glaucoma medication
    - (OR = 3.16, p=0.038, 95% CI = 1.066 - 9.346)
  - Presenting IOP >35 mmHg
    - (OR = 2.71, p=0.003, 95% CI = 1.418 - 5.155)
  - HM or worse vision at presentation
    - (OR = 2.03, p=0.022, 95% CI = 1.109 - 3.704)
- Gender, paracentesis at diagnosis, gonioscopy at diagnosis, complaint of discomfort at diagnosis, and VA of fellow eye were not associated with glaucoma progression
Conclusions

• Acute treatment of NVG with anti-VEGF is a viable treatment strategy.

• Factors at time of initial NVG presentation to a retina specialist associated with glaucoma progression despite anti-VEGF therapy:
  • 2 or more glaucoma medications
  • Any systemic glaucoma medication
  • IOP >35
  • HM or worse vision

• Prompt referral to a glaucoma specialist especially for patients with these presenting features may be warranted
Thank you
References


