Steroid Regimens in the Prevention of Irvine-Gass Syndrome

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Disclosures

• No financial disclosures.
• The view(s) expressed herein are those of the author(s) and do not reflect the official policy or position of Brooke Army Medical Center, Wilford Hall Ambulatory Surgical Center, the U.S. Army Medical Department, the U.S. Army Office of the Surgeon General, the Department of the Army, the Department of the Air Force and Department of Defense, or the U.S. Government.
Purpose

To describe the incidence of Irvine-Gass syndrome (pseudophakic cystoid macular edema, PCME) following cataract surgery with phacoemulsification in patients treated with either difluprednate, brand-name prednisolone acetate (PA), or generic PA, with or without the use of topical NSAIDs.
Methods

- Patients who underwent cataract extraction with phacoemulsification between January 1, 2018 and December 31, 2018 were selected from billing codes.
- Exam and medical history were confirmed via chart review.
- PCME defined as <20/25 BCVA and new cystic IRF on OCT.
Selection Criteria

- **Combined Surgery**
  - MIGS/glaucoma, cornea, retina, etc.

- **Vitreous Loss**
  - Posterior capsular rupture requiring anterior vitrectomy

- **Loss to Follow-Up**
  - Patients not seen within 3-6 months after surgery

- **All eyes s/p CEIOL in 2018**

- **Laser-Assisted CEIOL**
  - LenSx

- **Intravitreal Injection**
  - Bevacizumab, ranibizumab, aflibercept, steroid, etc.

- **Coexisting Macular Edema**
  - DME, RVO-related, etc.

- **899 Eyes Included in Study**
Results

Incidence of PCME by Steroids

- Total: 56/899
  - Difluprednate: 16/303
  - Brand Name PA: 16/357
  - Generic PA: 24/239

\[ p = 0.02 \]
Results

Pairwise Analysis: Rates of PCME by Brand Name PA

$p = 0.63$

$p = 0.009$
What about NSAIDs?
Incidence of Irvine-Gass by NSAID

\[ p = 0.19 \]
Incidence of Irvine-Gass by NSAID

- Difluprednate Alone: 5.4% (6/112), p = 0.96
- Brand Name PA Alone: 5.2% (9/167), p = 0.44
- Generic PA Alone: 5.4% (15/126), p = 0.31
- Difluprednate + NSAID: 11.9% (10/191)
- Brand Name PA + NSAID: 8.0% (7/910)
- Generic PA + NSAID: 8.0% (9/113)
## Subgroup Analysis

<table>
<thead>
<tr>
<th></th>
<th>No PCME (N = 844)</th>
<th>PCME (N = 56)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>69.5±9.5</td>
<td>68.4±10.2</td>
<td>p = 0.78</td>
</tr>
<tr>
<td><strong>Gender (Male)</strong></td>
<td>409 (48.5%)</td>
<td>31 (55.4%)</td>
<td>p = 0.32</td>
</tr>
<tr>
<td><strong>Resident vs. Attending</strong></td>
<td>599 (93.3%) vs. 245 (95.0%)</td>
<td>43 (6.7%) vs. 13 (5.0%)</td>
<td>P = 0.34</td>
</tr>
<tr>
<td><strong>PC Tear</strong></td>
<td>13 (92.9%)</td>
<td>1 (7.1%)</td>
<td>p = 0.89</td>
</tr>
<tr>
<td><strong>Hx of DM</strong></td>
<td>298 (92.0%)</td>
<td>26 (8.0%)</td>
<td>p = 0.08</td>
</tr>
<tr>
<td><strong>Mild NPDR</strong></td>
<td>10 (76.9%)</td>
<td>3 (23.1%)</td>
<td>p = 0.04</td>
</tr>
<tr>
<td><strong>Mod NPDR</strong></td>
<td>6 (85.7%)</td>
<td>1 (14.3%)</td>
<td>p = 0.44</td>
</tr>
<tr>
<td><strong>PDR</strong></td>
<td>6 (75.0%)</td>
<td>2 (25.0%)</td>
<td>p = 0.09</td>
</tr>
<tr>
<td><strong>ERM</strong></td>
<td>38 (73.1%)</td>
<td>14 (26.9%)</td>
<td>p = &lt;0.0001</td>
</tr>
<tr>
<td><strong>Hx of RVO</strong></td>
<td>2 (50.0%)</td>
<td>2 (50.0%)</td>
<td>p = 0.02</td>
</tr>
<tr>
<td><strong>Hx of RD</strong></td>
<td>11 (100.0%)</td>
<td>0 (0.0%)</td>
<td>p = 0.23</td>
</tr>
<tr>
<td><strong>Hx of Uveitis</strong></td>
<td>12 (100.0%)</td>
<td>0 (0.0%)</td>
<td>p = 0.21</td>
</tr>
<tr>
<td><strong>Hx of AMD</strong></td>
<td>99 (93.4%)</td>
<td>7 (6.6%)</td>
<td>p = 0.86</td>
</tr>
<tr>
<td><strong>Prostaglandin Use</strong></td>
<td>27 (96.4%)</td>
<td>1 (3.6%)</td>
<td>p = 0.52</td>
</tr>
</tbody>
</table>
Conclusion

• Generic PA is associated with higher rates of Irvine-Gass syndrome than either brand name PA or difluprednate, regardless of NSAID use.
• Generic PA may be inadequate after cataract extraction with phacoemulsification to prevent PCME.
Discussion

• Prior studies agree that there is no difference in PCME rates between difluprednate and brand name PA.\(^1\)
• Although anecdotal evidence suggests higher rates of PCME with generic PA, this is the first study that supports these findings.
• Similar to other studies,\(^2\) PCME in our study group occurred more frequently in patients with mild NPDR, ERM, or RVO.
• Although DM, moderate NPDR, and PDR were not significantly associated with PCME, there was a trend toward significance.
• NSAID use after cataract surgery may help prevent PCME;\(^3\) our study showed a possible benefit in brand name or generic PA (31-33% relative risk reduction), although lack of significance in our study may be related to insufficient power.
Discussion

- Brand name PA particles are smaller and more uniform than generic PA, allowing them to stay in suspension longer.\(^4\)
- Drop concentrations less predictable with generic PA (dose uniformity: difluprednate>brand name PA>generic PA).\(^5\)
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References