Distribution of Adherence to Intraocular Pressure Lowering Agents among Glaucoma Patients Is Bimodal and Robust to Operational Definitions of Glaucoma and Adherence

Jason P. Jones1A, Donald S. Fong1Ab, Ervin N. Fang1B, Claire A. Mesirov1A, Vaishali D. Patel2.

1Kaiser Permanente, Southern California; Research & Evaluation(A) and Ophthalmology(B)
2Global Health Outcomes Strategy and Research, Allergan, Irvine, CA.

Background and Objectives

- Glaucoma is the second leading cause of blindness after cataract (12.3% of blindness worldwide) [1]
- Lowering IOP with medication reduces disease progression [2,3]
- Overall research goal is to evaluate the link between adherence to IOP lowering agents and visual outcomes
- Objective of this phase is to evaluate different methods for identifying glaucoma patients and calculating adherence

Setting

Kaiser Permanente Southern California
- 3.5 million members representative of California pop.
- 6,000 physicians with 130 ophthalmologists

Eligibility—Periods of medical and prescription coverage tracked

Diagnosis and utilization
- ICD-9 diagnoses, including provider and specialty
- Administrative tracking of all procedures and encounters
- Pharmacy (electronic tracking since 1992)

Pharmacy
- 93% of members have prescription drug benefit
- 97% of medications filled in Kaiser Permanente pharmacies

Results

- Counts of incident patients between 2005 and 2009 ranged from 10,784 (requiring an ICD-9 of 365.10 or 365.11 from an ophthalmologist) to 60,538 (allowing any ICD-9 for 365.X)
- Using the days supplied field in the pharmacy claim reduced the medication possession ratio (MPR) while any ICD-9 requires an ICD-9 from any provider

Methods

Inclusion Criteria
- Age ≥ 18
- Both medical and prescription coverage during period
- At least 365 days of prior health insurance coverage
- No prior:
  - ICD-9 diagnosis of 365.1X from ophthalmology
  - 2 consecutive glaucoma prescription fills
  - Glaucoma related surgery
- Incident year between 2005 and 2009

Definitions of Glaucoma

A. ICD-9 365.1X from ophthalmology
B. ICD-9 365.X from any provider
C. Two consecutive ICP prescription fills
D. ICD-9 365.10/11 from ophthalmology
E. ICD-9 365.X from ophthalmology AND prescription for IOP lowering medication initiated within 90 days

Adherence (MPR—Medication Possession Ratio)
- Measured by year from incidence
- MPR = [# Days of Medication Access] / [# Days in Period]
- Days of Medication Access [4]
  - # Drops in bottle / # Drops per day x [# Bottles dispensed]
  - Drops per bottle adjusted based on over/under fill
- Days in Period: incidence to end of continuous enrollment
- Example: 0.5 = [50 Days of Medication] / [100 Days]

Analysis
- Descriptive statistics by definition of “Glaucoma”
- Density plots with medians for adherence

Conclusions

- Retrospective analyses of chronic conditions and adherence can result in dramatically different results on the basis of operational definitions of the condition and measures of adherence
- Basic pattern of adherence to topical ocular hypotensive agents was consistent across most definitions of glaucoma and adherence
- The bimodal nature of the distribution indicates measures such as “average compliance” in a population are not meaningful.

Table 1: 2005-2009 Glaucoma Patient Summary

<table>
<thead>
<tr>
<th>Definition</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean)</td>
<td>66.2</td>
<td>61.0</td>
<td>61.8</td>
<td>66.2</td>
<td>66.0</td>
</tr>
<tr>
<td>Age ≤ 60</td>
<td>70%</td>
<td>55%</td>
<td>72%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>Age ≥ 60</td>
<td>57%</td>
<td>41%</td>
<td>58%</td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>% Female</td>
<td>52%</td>
<td>55%</td>
<td>52%</td>
<td>51%</td>
<td>52%</td>
</tr>
<tr>
<td>Race: White</td>
<td>49%</td>
<td>47%</td>
<td>52%</td>
<td>49%</td>
<td>50%</td>
</tr>
<tr>
<td>Race: Black</td>
<td>17%</td>
<td>14%</td>
<td>15%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Race: Asian</td>
<td>10%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>23%</td>
<td>24%</td>
<td>21%</td>
<td>23%</td>
<td>23%</td>
</tr>
</tbody>
</table>

Table 1: 2005-2009 Glaucoma Patient Summary

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Incidence Year 2005-2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any 365.X (ICD-9)</td>
<td>6,000 Physicians (130 Ophthalmologists)</td>
</tr>
<tr>
<td>365.10 or 11 (ICD-9)</td>
<td>2009 Glaucoma Patient Summary</td>
</tr>
</tbody>
</table>

References