Opioid Utilization Patterns in United States Patients with Sickle Cell Disease

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Individuals with SCD suffer from many symptoms, most notably fatigue and recurrent pain.

Acute vaso-occlusive crisis (VOC) is a hallmark manifestation of SCD.

Opioids are the recommended treatment for VOCs and chronic pain.

Opioids are under-utilized in the management of SCD pain.

There is limited evidence on current treatment patterns with opioids in patients with SCD and their relation, if any, to the opioid epidemic.
OBJECTIVE

- Describe opioid treatment patterns in a large cohort of patients with SCD in the US
METHODS

• **Data Sources**
  • De-identified US administrative claims data extracted from the Truven Health MarketScan® Commercial & Medicaid Claims Databases
  • 5 years of data was extracted: January 1, 2009 through December 31, 2014

• **Patient Selection**
  • Either 1 inpatient or 2 outpatient (different days) non-diagnostic claims for SCD\(^1\)
  • Have continuous enrollment with medical and pharmacy benefits for the year identified and year prior
  • Patients could qualify for multiple years if they met the above criteria in each year (i.e., a patient could qualify in 2010, 2011, and 2012)

\(^1\) ICD-9 Diagnosis Code 282.41, 282.42 or 282.6x
DATA ANALYSIS

- Annual opioid treatment patterns were determined from outpatient pharmacy claims:
  - Number of claims; Days supplied and Morphine equivalent daily dose (MEDD)
- Average annual event rates per patient were reported for the following:
  - VOCs$^1$
  - Emergency department visits
  - Inpatient admissions
- Averages across all years are reported
- All results were reported by age group (from <6 to ≥ 45), and payer (Commercial, Medicaid)

VOC: Vaso-occlusive Crisis

$^1$ ICD-9 Diagnosis Code 282.42, 282.62, 282.64, or 282.69
### ANNUAL SCD COHORTS

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Cohort</td>
<td>2,619</td>
<td>2,748</td>
<td>2,929</td>
<td>3,285</td>
<td>2,752</td>
<td>2,969</td>
</tr>
<tr>
<td>Medicaid Cohort</td>
<td>4,807</td>
<td>5,055</td>
<td>4,963</td>
<td>5,189</td>
<td>6,649</td>
<td>7,007</td>
</tr>
</tbody>
</table>

- Unlike the Commercial cohort, the Medicaid cohort had a marked increase in patients over time\(^1\)

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\(^1\) MarketScan Medicaid Databases had an underlying increase in enrollees compared to Commercial Databases during this time frame; states contributing Medicaid data may vary over time.
## PATIENT CHARACTERISTICS (averaged for all years)

<table>
<thead>
<tr>
<th></th>
<th>Commercial</th>
<th>Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Age, Mean (SD)</strong></td>
<td>27.4 (17.2)</td>
<td>17.2 (13.1)</td>
</tr>
<tr>
<td><strong>Age Groups, N (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6 Years</td>
<td>235 (8%)</td>
<td>1,026 (18%)</td>
</tr>
<tr>
<td>6-11 Years</td>
<td>383 (13%)</td>
<td>1,252 (22%)</td>
</tr>
<tr>
<td>12-17 Years</td>
<td>451 (16%)</td>
<td>1,115 (20%)</td>
</tr>
<tr>
<td>18-30 Years</td>
<td>634 (22%)</td>
<td>1,372 (25%)</td>
</tr>
<tr>
<td>31-44 Years</td>
<td>579 (20%)</td>
<td>550 (9%)</td>
</tr>
<tr>
<td>≥45 Years</td>
<td>603 (21%)</td>
<td>298 (5%)</td>
</tr>
<tr>
<td><strong>Females, N (%)</strong></td>
<td>1,658 (58%)</td>
<td>2,965 (53%)</td>
</tr>
<tr>
<td><strong>SCD Genotype, N (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbSS</td>
<td>1,031 (36%)</td>
<td>2,480 (44%)</td>
</tr>
<tr>
<td>HbSC</td>
<td>259 (9%)</td>
<td>445 (8%)</td>
</tr>
<tr>
<td>Sickle Cell Thalassemia</td>
<td>194 (7%)</td>
<td>194 (4%)</td>
</tr>
<tr>
<td>Other</td>
<td>53 (2%)</td>
<td>73 (1%)</td>
</tr>
<tr>
<td>Unspecified/Unknown</td>
<td>1,348 (47%)</td>
<td>2,421 (43%)</td>
</tr>
</tbody>
</table>
As patients age, in both payers, opioid use increased from 30% to 60% (Commercial) and from 39% to 77% (Medicaid).
MEDICAID PATIENTS HAD MORE OPIOID DAYS SUPPLIED POST-TRANSITION; MEDD REMAINED SIMILAR

- MEDD and opioid days supplied both have a marked increase in patients ≥ 18 years old (transition and post-transition to adult SCD care)
SIMILAR TRENDS WERE SEEN BETWEEN OPIOID DAYS SUPPLIED AND HEALTHCARE RESOURCE UTILIZATION

- Medicaid patients had higher number of VOCs, healthcare utilization, and opioid days supplied compared to Commercial patients.
- VOCs and healthcare utilization had a marked increase in the transition to adult care (ages 18-30)

VOC: Vaso-occlusive Crisis; ED: Emergency Department; IP: Inpatient
OPIOID USE IN SCD PATIENTS HAS BEEN CONSTANT OVER TIME

* Reflects opioid use in the observed year (i.e., prior use for 2009 patients is presented for year 2008)
ǂ Reflects dispensed opioid prescriptions for the 4th quarter in each year (Dart et al. NEJM, 2015.)
OPIOID-RELATED DEATH RATE IN SCD IS SUBSTANCIALLY LOWER THAN OTHER DISEASE AREAS

### DEATHS DUE TO OPIOID PAIN RELIEVERS IN THE UNITED STATES FROM 1999-2013 IN NON-CANCER DISORDERS

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Due to All Causes</th>
<th>Due to OPR</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td>20,595,492</td>
<td>21,656</td>
<td>0.11</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>3,282</td>
<td>144</td>
<td>4.4</td>
</tr>
<tr>
<td>Low Back Pain</td>
<td>3,758</td>
<td>80</td>
<td>2.1</td>
</tr>
<tr>
<td>Migraine</td>
<td>2,286</td>
<td>103</td>
<td>4.5</td>
</tr>
<tr>
<td>Sickle Cell Disease</td>
<td>12,261</td>
<td>95</td>
<td>0.77</td>
</tr>
</tbody>
</table>

_Pain Medicine 2016; 17:1793_

OPR: Opioid Pain Reliever
NUMBER OF DEATHS DUE TO SCD AND OPIOIDS HAS REMAINED UNCHANGED OVER TIME

Adapted from Pain Medicine 2016; 17:1793.

Number of Deaths Due to SCD and Opioids from 1999-2013

- $y = 0.139x + 5.219$
- $r = 0.2412$
- $p = 0.3864$

OPR: Opioid Pain Reliever
LIMITATIONS

• Opioid-related deaths were not measured in this study and may not reflect published literature
• Findings from this study may not be generalizable to populations with other forms of insurance or the uninsured
• Data are limited to those captured in claims and identification of a diagnosis based on ICD-9-CM codes
• Potential for misclassification of SCD and genotypes
• Medication data indicate drugs administered in a physician’s office or filled through an outpatient pharmacy, but they do not indicate if the patient used the medication as prescribed
• Over-the-counter medications and medications administered in the inpatient setting are not captured
SUMMARY AND CONCLUSIONS

- Opioid utilization in the SCD population increases with age, but overall has remained steady despite rising concerns of epidemic opioid use in the US general population.
- Transition into adult care (ages 18-30) was associated with a marked increase in opioid utilization, IP admissions and VOCs.
- Opioid utilization protocols should account for the unique needs of patients with SCD.
- Better treatments/strategies to decrease opioid use by decreasing acute and chronic pain and SCD complications are warranted.
Thank you for Your Attention
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