Real-World Effectiveness of Voxelotor for the Treatment of Sickle Cell Disease: A Chart Review Study

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Disclosures

Global Blood Therapeutics employee and stockholder
Background

- Voxelotor (Oxbryta®) is a sickle hemoglobin–polymerization inhibitor approved by the FDA in November 2019 for the treatment of SCD in adults and adolescents ≥12 years of age under accelerated approval based on results from the HOPE trial, an international, randomized controlled study.¹

- In the HOPE trial, treatment with voxelotor 1500 mg increased average Hb by 1.1 g/dL over baseline at week 24 in patients with baseline Hb levels ranging between 5.5 g/dL and 10.5 g/dL.²

Objective

To assess the real-world effectiveness of voxelotor in treating SCD based on data during the first several months post FDA approval.

FDA, US Food and Drug Administration; SCD, sickle cell disease.
Methods

• An online, retrospective chart review conducted by Ipsos’ Syndicated Sickle Cell Disease Therapy
  o 77 practicing US physicians
  o first half of 2020
  o all had least 5 patients with SCD ≥12 years of age
  o each performed retrospective reviews of 5 to 12 patient records

• Indirect bilirubin, LDH and percent reticulocytes were collected at
  o treatment initiation
  o first and last measurements after initiation

• Changes in symptoms and other quality-of-life aspects assessed by physicians if patients started voxelotor before the most recent visit as part of their current SCD treatment

LDH, lactate dehydrogenase; SCD, sickle cell disease.
### Patient Characteristics

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Voxelotor N=56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, years</td>
<td>37</td>
</tr>
<tr>
<td>12 to &lt;18, n (%)</td>
<td>7 (13)</td>
</tr>
<tr>
<td>18 to 30, n (%)</td>
<td>17 (30)</td>
</tr>
<tr>
<td>31 to 50, n (%)</td>
<td>16 (29)</td>
</tr>
<tr>
<td>≥51, n (%)</td>
<td>16 (29)</td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>41 (73)</td>
</tr>
<tr>
<td>Genotype, n (%)</td>
<td></td>
</tr>
<tr>
<td>HbSS</td>
<td>23 (41)</td>
</tr>
<tr>
<td>HbSC</td>
<td>19 (34)</td>
</tr>
<tr>
<td>HbSβ0</td>
<td>10 (18)</td>
</tr>
<tr>
<td>Mean baseline Hb, g/dL</td>
<td>8.4</td>
</tr>
<tr>
<td>&lt;5.5, n (%)</td>
<td>7 (13)</td>
</tr>
<tr>
<td>5.5 to 10.5, n (%)</td>
<td>37 (66)</td>
</tr>
<tr>
<td>&gt;10.5, n (%)</td>
<td>12 (21)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comorbidities, n (%)</th>
<th>Voxelotor N=56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaso-occlusive crises</td>
<td>15 (27)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>14 (25)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>8 (14)</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>6 (11)</td>
</tr>
<tr>
<td>Leg ulcers</td>
<td>5 (9)</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>5 (9)</td>
</tr>
<tr>
<td>Depression/anxiety</td>
<td>4 (7)</td>
</tr>
<tr>
<td>Obesity (BMI ≥30)</td>
<td>4 (7)</td>
</tr>
<tr>
<td>Acute chest syndrome</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Ophthalmic complications</td>
<td>2 (4)</td>
</tr>
<tr>
<td>None of the above</td>
<td>22 (39)</td>
</tr>
</tbody>
</table>

BMI, body mass index; Hb, hemoglobin; HbSβ0, sickle beta zero thalassemia; HbSC, heterozygous for sickle cell disease; HbSS, homozygous for sickle cell disease.
Current and Historic SCD Treatments

Previous SCD Treatments in 56 Patients

- None: 20
- One: 11
- Two: 16
- Three or more: 9

Treatment Combinations in 56 Patients On Voxelotor

- Voxelotor alone: 24
- Voxelotor + 1: 22
- Voxelotor + 2: 10

SCD, sickle cell disease.
Reasons for Prescribing Voxelotor

- Reduces risk of stroke and silent infarcts
- Patient/caregiver preference
- Impact on patient’s quality of life
- Low incidence of drug-drug interactions
- Uncomplicated insurance approval process
- Impact on patient’s quality of life
- Patient/caregiver preference
- Reduces risk of stroke and silent infarcts
- Reduces polymerization/sickling and hemolysis
- Ease of administration
- Good overall safety profile
- Few reported side effects
- Improves day-to-day energy levels
- Reduces long-term organ damage
- Uncomplicated insurance approval process
- Low incidence of drug-drug interactions
- Impact on patient’s quality of life
- Patient/caregiver preference
- Reduces risk of stroke and silent infarcts
- Reduces anemia
- Reduces the frequency of vaso-occlusive crises (VOCs)
- Reduces pain
- Reduces the need for blood transfusions
- Reduces mortality
- Uncomplicated insurance approval process
- Low incidence of drug-drug interactions
- Impact on patient’s quality of life
- Patient/caregiver preference
- Reduces risk of stroke and silent infarcts
Hemoglobin Change Among Patients Receiving Voxelotor

- **Mean 8.42 g/dL**: 9 patients, Change +1.05
- **Mean 9.47 g/dL**: 16 patients, Change +1.20
- **Mean 9.38 g/dL**: 17 patients, Change +1.05

On-Treatment Hb:
- >10.5
- 9.5-10.5
- 8.1-9.5
- 7.1-8.0
- 5.5-7.0
- <5.5

*Occurred on average 4 weeks after treatment initiation
Hb change calculated based on paired patient-level comparisons at each time point
Physician-Reported Symptoms and Quality-of-Life Changes Among Patients Receiving Voxelotor

- Had less fatigue: 53%
- Had less pain: 53%
- Missed less work or school: 30%
- Required fewer transfusions or stopped transfusions: 20%
- No symptom improvement: 13%

Percentage of patients, %
Conclusions

- In this real-world evidence study, voxelotor increased Hb by over 1 g/dL on average and decreased hemolysis markers among patients with SCD tested for Hb in this sample, to a degree consistent with the randomized, controlled HOPE trial results.

- Evidence also suggests that voxelotor treatment was associated with improvement in important symptoms of SCD and other aspects of quality of life.

- Further evaluation with a larger sample size and longer follow-up will help confirm these findings.

Hb, hemoglobin; SCD, sickle cell disease.
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• Marina Gavriel
• Doug Saulsbury
• Nicole Allie
• Sarah Brown

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