Real-World Effectiveness of Voxelotor for Treating Sickle Cell Disease in the US

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Until late 2019, few treatments had been approved by the FDA for treating SCD.

Voxelotor (Oxbryta®) was approved by the FDA in November 2019 for the treatment of SCD in patients ≥12 years of age under an accelerated approval based on results of the pivotal HOPE study.¹

In the HOPE study,² **voxelotor was associated with an average Hb increase of 1.1 g/dL**, and 51% of patients receiving voxelotor 1500 mg achieved a >1 g/dL Hb increase at week 24.

This study sought to assess the real-world effectiveness of voxelotor based on data during the first 7 months post FDA approval.

¹Eligible patients had Hb levels between 5.5 and 10.5 g/dL, experienced 1 to 10 VOCs in the previous year, and were not transfusion dependent.

Methods

• Data on medical and pharmacy claims for patients who were aged ≥12 years and receiving voxelotor from December 2019 to June 2020 were obtained from the Symphony Health claims data set.
  + Patients with at least 1 year of data prior to their first voxelotor claim date were included.

• Rates of transfusions and VOCs per patient per year (PPPY) were compared for the 3-months before voxelotor initiation versus the period after voxelotor initiation (mean follow-up, 2.9 months).

• Change in Hb level and the percentage of patients achieving a >1 g/dL increase in Hb were assessed in the subset of patients with Hb laboratory data available.
  + Evaluated patients had at least 1 Hb measurement within 30 days before voxelotor initiation and at least 1 Hb measurement after voxelotor initiation.

• Confidence intervals and P values for changes in outcomes were based on bootstrapping.

Hb, hemoglobin; VOC, vaso-occlusive crisis.
Patients who received voxelotor up to June 30, 2020
n=1375

With ≥12 months data prior to voxelotor initiation
n=1368

With no evidence of clinical trial participation
n=1329

With at least 1 Hb test within 30 days before and at least 1 test after voxelotor initiation
n=37

Hb, hemoglobin.
Voxelotor Resulted in Significant Improvements in Hb

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Average Hb n=37</th>
<th>Maximum Hb n=37</th>
<th>Last Hb n=37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb, g/dL, mean (CI 95%)</td>
<td>7.8 (7.3, 8.3)</td>
<td>8.7 (8.0, 9.5)</td>
<td>9.3 (8.5, 10.1)</td>
<td>8.7 (7.9, 9.5)</td>
</tr>
<tr>
<td>Change, mean (CI 95%)</td>
<td>–</td>
<td>0.9 (0.4, 1.4)</td>
<td>1.5 (0.9, 2.0)</td>
<td>0.8 (0.2, 1.5)</td>
</tr>
<tr>
<td>P value</td>
<td>–</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>0.008</td>
</tr>
</tbody>
</table>

- 54.1% of patients achieved a >1 g/dL Hb increase at some time point
- 29.7% of patients achieved a >2 g/dL Hb increase at some time point
Voxelotor Was Associated With Significant Reductions in Rates of Transfusions and VOCs

<table>
<thead>
<tr>
<th>Rate</th>
<th>Number of patients, n</th>
<th>Pre-index value, mean (95% CI)</th>
<th>Post-index value, mean (95% CI)</th>
<th>Change, mean (95% CI)</th>
<th>Percent reduction</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfusions among all patients</td>
<td>1329</td>
<td>0.12 (0.09, 0.15)</td>
<td>0.08 (0.06, 0.11)</td>
<td>−0.04 (−0.07, −0.01)</td>
<td>33%</td>
<td>0.018</td>
</tr>
<tr>
<td>≥1 transfusion in prior year</td>
<td>187</td>
<td>0.9 (0.7, 1.0)</td>
<td>0.5 (0.3, 0.6)</td>
<td>−0.4 (−0.6, −0.2)</td>
<td>44%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥8 transfusions in prior year</td>
<td>22</td>
<td>3.0 (2.4, 3.7)</td>
<td>1.7 (0.8, 2.7)</td>
<td>−1.4 (−2.4, −0.2)</td>
<td>47%</td>
<td>0.018</td>
</tr>
<tr>
<td>VOCs among all patients</td>
<td>1329</td>
<td>1.0 (0.9, 1.2)</td>
<td>0.7 (0.6, 0.8)</td>
<td>−0.3 (−0.4, −0.3)</td>
<td>30%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥1 VOC in prior year</td>
<td>475</td>
<td>2.9 (2.7, 3.1)</td>
<td>1.7 (1.5, 1.9)</td>
<td>−1.3 (−1.5, −1.1)</td>
<td>45%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

VOC, vaso-occlusive crisis.
Conclusions

Based on the first 7 months’ data after the approval of voxelotor in the US, in real-world practice, voxelotor increases mean Hb by approximately 1 g/dL, consistent with the results of the HOPE trial.

Rates of transfusion and VOC were decreased after voxelotor initiation.

This real-world evidence provides additional support for the use of this novel therapy in the treatment of hemolytic anemia and its associated complications in the SCD population.

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

Hb, hemoglobin; SCD, sickle cell disease; VOC, vaso-occlusive crisis.
Acknowledgments

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