Results of mecasermin treatment in pediatric patients evaluated for severe and partial primary deficiency of IGF-1

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The authors have nothing to disclose. The authors report no conflicts of interest.

Background
Severe primary deficiency of insulin-like growth factor-1 (IGF1) being characterized by growth failure and short stature in children, constitutes an indication to recombinant human IGF-1 (mecasermin) treatment. It is defined by serum insulin-like-growth factor-1 (IGF-1) levels less than or equal to 2.5 th percentile, height less than or equal to -3SDS, normal growth hormone (GH) secretion and exclusion of secondary causes of IGFD.

Objective
Our objective was to present results and possible side effects of mecasermin treatment in pediatric patients evaluated for severe and partial primary deficiency of IGF-1 at a pediatric endocrinology unit in Poland.

Methods
We present 5 patients (4 male and 1 female) (aged: 7 to 16 years) treated in our unit with mecasermin between 2010 and 2018. The patients were qualified for replacement therapy by performing physical examination with stature measurement and running laboratory and radiological tests according to the protocol. The presence of IGFD was confirmed by IGF-1 generation test. We performed genetic tests involving IGF-1 – GH pathway in William Harvey Research Institute, Barts and the London School of Medicine. Initial doses of mecasermin 0.04 mg/kg to the maximum dose of 0.12 mg/kg twice daily were given.

Results
Our results show that therapy with mecasermin in case of partial IGFD provides comparable satisfactory results to severe IGFD treatment.

Table 1. Height velocity in patients during treatment with mecasermin

<table>
<thead>
<tr>
<th>Patient</th>
<th>Delta (ng/ml)</th>
<th>First year of treatment (cm/year)</th>
<th>Second year of treatment (cm/year)</th>
<th>Recent year of treatment (cm/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>71</td>
<td>7.8</td>
<td>8.2</td>
<td>8.9</td>
</tr>
<tr>
<td>Patient 2</td>
<td>11</td>
<td>6.5</td>
<td>6.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Patient 3</td>
<td>66</td>
<td>5.7</td>
<td>-</td>
<td>8.4</td>
</tr>
<tr>
<td>Patient 4</td>
<td>16</td>
<td>6.0</td>
<td>6.1</td>
<td>6.9</td>
</tr>
<tr>
<td>Patient 5</td>
<td>12.8</td>
<td>7.6</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

One of our patients: Patient 2 and Patient 4 consent to be tested by William Harvey Research Institute, Barts and the London School of Medicine in order to search for possible 1q21.1 microdeletion. Many studies report that 1q21.1 deletions are associated with a wide range of abnormalities in pediatric population. This type of chromosomal aberration is marked by i.a. delayed development, short stature, intellectual disabilities, dysmorphic facial features, skeletal anomalies, congenital heart diseases, neurological problems or may be not associated with any of features listed above.

Conclusion
Therapy with mecasermin in case of partial IGFD provides comparable satisfactory results to severe IGFD treatment.

References

Figure 1. Graphic illustration showing height velocity in treated patients

Figure 2. Mean height velocity in patients with partial IGFD comparing to patients with severe IGFD

Figure 3. The structure of 1q21.1

Figure 4. a,b,c Patient 2

Source: https://en.wikipedia.org/