Metreleptin and Metformin Use in an Infant with Congenital Generalized Lipodystrophy Secondary to AGPAT2 Mutation

Cintya Schweisberger

Follow this and additional works at: https://scholarlyexchange.childrensmercy.org/researchdays

Schweisberger, Cintya, "Metreleptin and Metformin Use in an Infant with Congenital Generalized Lipodystrophy Secondary to AGPAT2 Mutation" (2021). Research Days. 16.
https://scholarlyexchange.childrensmercy.org/researchdays/GME_Research_Days_2021/researchday3/16

This Poster Presentation is brought to you for free and open access by the Conferences and Events at SHARE @ Children's Mercy. It has been accepted for inclusion in Research Days by an authorized administrator of SHARE @ Children's Mercy. For more information, please contact library@cmh.edu.
Metreleptin and Metformin Use in an Infant with Congenital Generalized Lipodystrophy Secondary to AGPAT2 Mutation

Cintya Schweisberger, DO; Jill Jacobson, MD; Emily Paprocki, DO

Children’s Mercy Kansas City

Background

- Congenital Generalized Lipodystrophy (CGL) is characterized by widespread fat loss and severe metabolic abnormalities [1].
- Metreleptin, a synthetic leptin analog, is shown to decrease fasting triglycerides, fasting glucose, and HbA1c [2].
- Metformin use in infants has only been described in a few case reports of CGL and Donohue syndrome [3] (insulin receptor mutation), and there is no established dosing for this age group.

Case

- 2-month-old SGA term female was noted to have poor weight gain, hyperphagia, and abdominal distension at a well child check.
- She was admitted for failure to thrive with weight z-score of -2.17 and length z-score of -0.15.
- Initial labs were notable for triglycerides 5,167 mg/dL, blood glucose 324 mg/dL, ALT 212 units/L, AST 215 units/L, elevated random insulin level of 257 mcIU/mL, and HbA1c 8.9% (Table 1).

Clinical Course

- Day 1: Started on detemir 1.0 units/kg/day (titrated to a maximum dose of 4.4 units/kg/day).
- Day 3: Started on metformin suspension 50 mg/kg/day.
- Day 4: Triglycerides, glucose, and LFTs decreased (Table 1).
- Discharged home on glargine 0.7 units/kg/day (insurance denied detemir) and metformin.
- Genetically evaluated revealed that she was homozygous for a pathogenic variant in the AGPAT2 gene.

Conclusion

- Leptin is important in regulation of lipid and glucose metabolism, and patients with CGL are deficient due to lack of adipose tissue.
- Metabolic abnormalities, including stabilization of glucose and improved hypertriglyceridemia, in our patient markedly improved with initiation of metreleptin, metformin, and insulin.
- Medications were well tolerated without side effects.
- We present successful dosing of these treatment modalities without adverse reactions in an infant with CGL.

Labs

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 4</th>
<th>3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triglycerides (mg/dL)</td>
<td>5,167</td>
<td>758</td>
<td>229</td>
</tr>
<tr>
<td>HDL (mg/dL)</td>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glucose (mg/dL)</td>
<td>324</td>
<td>113-138</td>
<td>62-114</td>
</tr>
<tr>
<td>HgbA1c (%)</td>
<td>8.9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Insulin (mcIU/mL)</td>
<td>257</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AST (units/L)</td>
<td>215</td>
<td>119</td>
<td>51</td>
</tr>
<tr>
<td>ALT (units/L)</td>
<td>212</td>
<td>124</td>
<td>48</td>
</tr>
<tr>
<td>Leptin (ng/mL)</td>
<td>0.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Adiponectin (mcg/mL)</td>
<td>&lt;0.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bicarbonate (mmol/L)</td>
<td>17</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

References