Beyond Insulin: Liraglutide in the Treatment of Type 1 Diabetes Mellitus

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OBJECTIVE

To determine the efficacy of liraglutide on glycemic control in patients with type 1 diabetes mellitus (T1DM).

BACKGROUND

• Limited data regarding the use of exogenous incretin therapy in patients with T1DM1-5
• Liraglutide is a once daily GLP-1 mimetic FDA approved to treat type 2 diabetes mellitus.
• The fluctuating glucose concentrations in T1DM patients may be due to hyperglucagonemia.3,6
• Liraglutide may improve glycemic control in T1DM by decreasing postprandial glucagon secretion from alpha cells.

METHODS

• Retrospective study conducted after institutional review board approval
• Subjects identified and information obtained utilizing an electronic medical record system

Patient Population

• T1DM patients aged 18 to 75 years, receiving 1.8 mg of liraglutide daily for at least 3 months
• Receiving continuous subcutaneous insulin infusion (CSII)
• Using a continuous glucose monitoring device or regularly measuring their blood glucose

Data Collection

• Demographic information
• Time points evaluated: Before liraglutide initiation (6 months and 3 months), baseline (at liraglutide initiation), after liraglutide initiation (3 months and 6 months)
• Primary outcome measures taken at each time point:
  • Hemoglobin A1c (A1c) – Total daily insulin dose (TDD)
  • Body weight
  • Body mass index (BMI)
  • Blood pressure

Statistical Analysis

• Data compared using a repeated-measures ANOVA and a Bonferroni post-hoc test
• p-values < 0.05 were considered statistically significant

RESULTS

Patient Demographics (N = 40)

- Age (years ± SD) 46.6 ± 11.8
- Duration of T1DM (years ± SD) 22.5 ± 10.9
- Gender (% Female) 65%
- Ethnicity (% Caucasian) 95%

RESULTS (continued)

Example Patient 14-day CSII Download

Non-Statistically Significant Results

<table>
<thead>
<tr>
<th>Primary Outcome Measure</th>
<th>Baseline</th>
<th>3 Months After</th>
<th>6 Months After</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average TDD (% of baseline ± SD)</td>
<td>100 ± 0</td>
<td>93.8 ± 11.4</td>
<td>96.9 ± 15.5</td>
<td>0.071</td>
</tr>
<tr>
<td>28-day CSII glucose average (mg/dL ± SD)</td>
<td>186.6 ± 34.6</td>
<td>174.3 ± 32.8</td>
<td>173.9 ± 35.1</td>
<td>0.160</td>
</tr>
<tr>
<td>28-day incidence of hypoglycemia</td>
<td>5.8 ± 6.0</td>
<td>4.6 ± 5.0</td>
<td>4.6 ± 6.4</td>
<td>0.832</td>
</tr>
<tr>
<td>Average diastolic blood pressure (mmHg ± SD)</td>
<td>75.3 ± 8.1</td>
<td>72.1 ± 10.2</td>
<td>70.5 ± 8.5</td>
<td>0.199</td>
</tr>
</tbody>
</table>

RESULTS (continued)

CONCLUSIONS

Liraglutide added to insulin therapy in patients with T1DM leads to significant reductions in A1c, body weight, BMI, and systolic blood pressure.

REFERENCES