Aims

The aim of this analysis was to summarize and update the evidence on relative efficacy and safety of insulin aspart (IAsp) and regular human insulin (RHI) in both types of diabetes in the prandial insulin therapy.

Introduction

• Prandial insulin is a key component in insulin treatment of type 1 diabetes mellitus (T1DM) and in many type 2 diabetes mellitus (T2DM) patients.
• The use of RHI for prandial dosing has several limitations related to its pharmacological profile and may increase the risk of hypoglycemia due to underdosed prolonged activity.
• IAsp is a rapid-acting insulin analog, characterized by faster onset of action and shorter duration, which allows for a precise control of prandial glycemia.

Methods

A systematic search of electronic medical databases (MEDLINE, EMBASE, Cochrane CENTRAL) was performed. Studies included those published in English, French, German or Italian.

Results

Patients with T1DM

Glycemic control

Table 1. Relative change in HbA1c levels for comparison between IAsp and RHI in patients with T1DM

<table>
<thead>
<tr>
<th>Study Methodology</th>
<th>Baseline HbA1c (%)</th>
<th>Median HbA1c (%)</th>
<th>Baseline Insulin</th>
<th>Insulin</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bretzel 2004</td>
<td>8.8</td>
<td>7.4</td>
<td>MDI / NPH</td>
<td>IAsp vs RHI</td>
<td>No events</td>
</tr>
<tr>
<td>Halle 2003</td>
<td>8.3</td>
<td>7.5</td>
<td>MDI / NPH</td>
<td>IAsp vs RHI</td>
<td>No events</td>
</tr>
<tr>
<td>Maiti 2012</td>
<td>8.0</td>
<td>8.0</td>
<td>MDI / NPH</td>
<td>IAsp vs RHI</td>
<td>No events</td>
</tr>
<tr>
<td>Tamer 2011</td>
<td>8.0</td>
<td>8.0</td>
<td>MDI / NPH</td>
<td>IAsp vs RHI</td>
<td>No events</td>
</tr>
</tbody>
</table>

No. of patients = 8,3/8.1 MDI / no basal

No. of patients = 707/358 8,0/8,0 MDI/NPH

No. of patients = 20/21 7,4/7,5 MDI/NPH

17. 41st EASD Annual Meeting; 2005; Athens, Greece.
21. 41st EASD Annual Meeting; 2005; Athens, Greece.
27. 41st EASD Annual Meeting; 2005; Athens, Greece.

Hypoglycemia

Neither study reported the risk of overall hypoglycemic episodes regardless of their severity. Postulated results of five RCTs demonstrated a comparable risk of severe hypoglycemia between treatment groups (RR=0.80 [0.36, 1.60]).

Charactertistics of included studies

A total of 36 studies were screened, of which 12 RCTs were considered potentially relevant. Finally, 36 RCTs fulfilled prespecified eligibility criteria and were included in this analysis (Figure 1).

Figure 1. Flowchart of included studies

Conclusions

IAsp provided better glycemic control when compared with RHI to T1DM and in patients receiving prandial insulin treatment. T1DM patients treated with IAsp were less prone to develop nocturnal hypoglycemia, and while both interventions presented a comparable risk of severe hypoglycemic events in both types of diabetes.