IMPROVED METABOLIC CONTROL WITH A FAVORABLE WEIGHT PROFILE IN PATIENTS WITH TYPE 2 DIABETES TREATED WITH INSULIN GLARGINE (LANTUS®) IN CLINICAL PRACTICE

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ABSTRACT

Improving metabolic control without weight gain is a challenge in the management of Type 2 diabetes. In this open label, single center, nine-month study in clinical practice, the effect of insulin glargine (LANTUS®) on metabolic control and body weight was evaluated in 72 patients with Type 2 diabetes. Thirty-two insulin-naïve patients who were previously on oral antidiabetic medication were initiated on once-daily insulin glargine with either glimepiride (Amaryl®) or, in a few cases, glimepiride plus metformin, after participating in an educational program on insulin therapy. Forty patients treated previously with insulin were switched to once-daily insulin glargine plus mealtime regular human insulin or insulin lispro, after an educational program on intensified conventional therapy (ICT). Metabolic control and body weight were monitored for 9 months. In the 32 patients treated previously with oral agents, metabolic control improved significantly from baseline (HbA1c decreased from 9.0% to 7.4%; p <0.005), while body weight was reduced vs baseline. In the 40 patients treated previously with insulin, no statistically significant change in body weight from baseline to endpoint was detected. HbA1c improved significantly in the 13 patients who were previously on mixed insulin (–1.7%; p <0.04 vs baseline) and in the 15 patients on oral agents plus NPH insulin (–1.5%; p <0.05 vs baseline). In patients previously on ICT (n=12), there was a trend towards increased HbA1c (+0.5%). Overall, in the 72 patients examined in this study, there was a significant reduction in HbA1c from baseline to endpoint (8.14% to 7.58%; p <0.001). This was accompanied by slight weight reduction (94.91 kg to 93.79 kg). In conclusion, insulin glargine in combination with glimepiride or prandial insulin improves metabolic control while showing a favorable weight profile, in patients with Type 2 diabetes.

INTRODUCTION

- The advent of insulin analogs is of major clinical significance in the treatment of diabetes. Patients with Type 2 diabetes often benefit from approaches that aim to improve insulin sensitivity, such as weight reduction through dietary modifications and exercise. However, these approaches often do not lead to satisfactory glycemic control and, consequently, pharmacologic therapy is required.
- Improved metabolic control without weight gain is a challenge in the drug treatment of Type 2 diabetes, especially since insulin therapy is often associated with weight gain.
- Insulin glargine (LANTUS®) is a novel, long-acting human insulin analog, which has a smooth action profile with no pronounced peak and a prolonged duration of action that makes it appropriate for once-daily use.
- Once-daily insulin glargine is as effective as once or twice-daily NPH insulin in improving and maintaining glycemic control in Type 2 diabetes.
- Previous studies have demonstrated that insulin glargine improves metabolic control and has a favorable weight profile and reduced incidence of nocturnal hypoglycemia in patients with Type 1 diabetes and Type 2 diabetes.

STUDY OBJECTIVES

- To evaluate the effect of insulin glargine combined with prandial insulin or oral hypoglycemic agents (OHAs) on metabolic control and body weight in patients with Type 2 diabetes who had received pre-treatment with OHAs only, or pre-treatment with conventional insulin therapy or intensified conventional insulin therapy (ICT).
- To determine whether the efficacy variables were influenced by the type of insulin therapy that patients received prior to commencing their insulin glargine regimen.
- To improve patient education for self-management of insulin therapy and diet, in order to optimize glycemic control and minimize weight gain.

STUDY DESIGN AND METHODS

Study design

- Single center, open-label, 9 month study carried out in a diabetes practice in Germany.
- The study design is summarized in Figure 1.

Insulin-naïve patients

- Prior to initiating insulin glargine treatment, insulin-naive patients (n=27) were divided into subgroups and received insulin pre-treatment: 11 were pre-treated with OHAs plus insulin; 16 remained on OHAs only.
- After participating in an educational program on insulin therapy and diet, these patients were initiated on once-daily insulin glargine with one of the following therapies:
  - Glimepiride (Amaryl®) (n=21)
  - Glimepiride plus metformin (n=6)
Insulin-experienced patients

- Prior to initiating insulin glargine treatment, insulin-experienced patients (n=33) were divided into subgroups and received pre-treatment with ICT (n=23) or with conventional insulin therapy (n=10).
- After taking part in an educational program on ICT, these patients were switched to once-daily insulin glargine plus mealtime regular human insulin or insulin lispro.

Patients

- Patients with Type 2 diabetes (n=72).
- The data presented here refer only to those patients who received insulin glargine for 9 months (n=60).
- Patients who received insulin glargine for longer than nine months (n=12) have been excluded.
- The dose of insulin glargine was titrated, whilst the dose of OHAs was kept stable.

Efficacy variables

Metabolic control

- Metabolic control was monitored at the start of the study (baseline) and after 9 months (endpoint) through measurement of HbA1c.

Body weight

- Changes in body weight were monitored at baseline and endpoint.

Safety measurements

- Severe hypoglycemia (requiring the assistance of a third party) was recorded; mild episodes were not recorded.

Statistical analysis

- All variables were analyzed using descriptive statistics.

RESULTS

Patients

- Baseline characteristics of patients enrolled in the study are summarized in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (male/female)</th>
<th>OHA pre-treatment</th>
<th>Insulin only pre-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient numbers</td>
<td>60 (33/27)</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Age (years)</td>
<td>60.2 ± 8.1</td>
<td>58.0 ± 9.0</td>
<td>62.3 ± 6.8</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>94.9 ± 19.8*</td>
<td>97.0 ± 19.9</td>
<td>91.4 ± 32.8</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>8.1 ± 1.6</td>
<td>8.8 ± 1.6</td>
<td>7.0 ± 1.3</td>
</tr>
</tbody>
</table>

* Male 99.0 kg; Female 88.1 kg
Efficacy

Metabolic control

- In the 60 patients examined in this study, there was a significant reduction in HbA1c from baseline to endpoint (8.1% to 7.3%; p <0.001) (Figure 2)
- In the 27 patients pre-treated with OHA, metabolic control improved significantly from baseline, as indicated by a decrease in HbA1c of 1.5% (8.8% to 7.3%; p <0.01) (Figure 2)
- In the 33 patients pre-treated with insulin only, there was no change in HbA1c (Figure 2)

Figure 2. Reduction in mean HbA1c levels in patients with Type 2 diabetes treated with insulin glargine for 9 months

Body weight

- Following 9 months’ treatment with insulin glargine, in the 60 patients examined, there was a slight but detectable reduction in body weight (94.9 kg to 93.8 kg) (Figure 3)
- At endpoint, a reduction in body weight was detected in the 27 patients pre-treated with OHA (mean weight loss 1.1 kg) and in the 33 patients pre-treated with insulin only (mean weight loss 1.2 kg; Figure 3)

Figure 3. Reduction in body weight in patients with Type 2 diabetes treated with insulin glargine for 9 months

Efficacy

Metabolic control: pre-treatment subgroups

- Following treatment with insulin glargine, HbA1c levels had altered as shown in Figure 4
- A reduction in HbA1c was detected in the subgroup of patients who were pre-treated with OHA plus insulin (n=11; 1.64% decrease; p <0.05 vs baseline)
- There was no significant change in HbA1c levels in the patients pre-treated with ICT (n=23) or in the patients pre-treated with conventional insulin therapy (n=10)
After switching to insulin glargine, there was a clear reduction in body weight in all patients who had received insulin pre-treatment (Figure 5).

No unexpected adverse events or episodes of severe hypoglycemia were reported.

Overall, over a 9 month period, insulin glargine in combination with glimepiride (and metformin in a small proportion of patients \( n = 6 \)), or prandial insulin, significantly improved metabolic control in patients with Type 2 diabetes, without increasing body weight. The favorable weight outcomes in this study could be attributed to the synergistic approach of providing dietary patient education prior to insulin glargine treatment.

REFERENCES