

# A Report from the 44th Annual Meeting of the European Association for the Study of Diabetes

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The 44th Annual Meeting of the European Association for the Study of Diabetes (EASD) is the most important European forum for diabetes discourse. This year's congress, which attracted ~12,000 attendees and >2400 submitted abstracts, was held in the Nuova Fiera di Roma (New Rome Fair) conference and exhibition center located about a half-hour from central Rome. EASD, which was founded in Italy in 1965, encourages and supports research in the field of diabetes and the rapid diffusion of acquired knowledge. Members of the Association include scientists, physicians, laboratory workers, nurses, and students from around the globe.

As the number of people with diabetes continues to increase, the costs of diabetes care continue to increase as well. Highlighted here are several presentations that focused on real-life studies and the benefits of insulin therapy.

## The LIVE-DE Study

The long-acting insulin glargine versus neutral protamine Hagedorn (NPH) insulin cost-evaluation study in Germany (LIVE-DE), presented by T. Scholten et al, explored the cost advantages and improved patient satisfaction with insulin glargine treatment among patients with type 2 diabetes mellitus (DM). This was a noninterventional, cross-sectional study of 1602 patients conducted in 199 randomly selected primary care clinics in Germany. Patients were treated with glargine- or NPH-based regimens for ≥6 months. The primary objective of this study was to assess total diabetes-related treatment costs (DTCs) derived from medications (insulins, oral antidiabetic drugs [OADs]), self-monitoring of blood glucose (test strips, lancets), treatment of hypoglycemia (glucagon use), and needle usage for a 6-month period under real-life conditions. The authors concluded that, under those conditions, total DTCs were similar for glargine and NPH in patients with type 2 DM, whereas patient satisfaction was higher with glargine than with NPH insulin.

## The THIN Study

In this study, presented by A.P. Tetlow et al, researchers utilized The Health Improvement Network (THIN) database, a primary care database in the United Kingdom that includes 2,335,667 active patients from 211 practices recorded over 15 years, to compare the cost-effectiveness of glargine with that of detemir in patients with type 2 DM who were new to insulin treatment. Patients were treated with either glargine (n = 2197) or detemir (n = 357), and their glycosylated hemoglobin (A1C) was measured for 12 months after treatment initiation. Patients in the 2 groups had similar demographic characteristics and risk-factor profiles at baseline. Results showed that the glargine-treated patients had a 0.29% ( $P = 0.021$ ) greater reduction in A1C than did the detemir-treated patients over the 12-month period. After adjusting for available confounding variables, glargine was found to be more cost-effective than detemir, with marginal cost savings.

## The ROLE Study

The ROLE study, presented by J.L. Leahy et al, was a real-world study that compared insulin glargine and NPH insulin in terms of 2-year glycemic control, hypoglycemia rates, and health care costs in patients with type 2 DM. The investigators reviewed a large database of managed-care patients with type 2 DM in the United States between 2001 and 2005. Patients were treated with glargine (n = 2105) or NPH (n = 734) in addition to OADs, maintained continuous plan enrollment for >18 months (6 months before and at least 12 months after insulin initiation), and had their A1C measured at a central laboratory. Adjusted 1-year total health care costs were \$16,184 for patients who were treated with glargine and \$21,104 for those who were treated with NPH (quarterly difference, -\$1034;  $P = 0.0372$ ). Two-year costs were \$30,032 for the glargine group and \$42,208 for the NPH group (quarterly difference, -\$1522;  $P = 0.0029$ ). Patients had the same mean age (54 years) at baseline, and no statistically significant differences in medical insurance claims for hypoglycemia were observed between the 2 groups (glargine, 3.2%; NPH, 4.3%). The investigators concluded that patients who were treated with glargine had sustained improvements in glycemic control, lower rates of medical claims for hypoglycemia, and lower total health care expenditures than did patients who were treated with NPH insulin.

## The GINGER Study

Many patients with type 2 DM use premixed insulin regimens. However, this approach does not allow for flexibility in daily routine, and patients are at risk of hypoglycemic events and insufficient glycemic control. The GINGER study

(a 52-week, open-label, randomized, multinational, multicenter clinical trial comparing glargine/gulisine in an intensified insulin regimen and 2-injection conventional insulin therapy in patients with type 2 DM who had poor glycemic control and were pretreated with 2-injection conventional premixed insulin therapy), presented by A. Fritsche et al, compared the efficacy and safety of mealtime, rapid-acting glargine and glulisine once daily in a basal-bolus regimen ( $n = 153$ ) and an optimized conventional therapy of 2 subcutaneous injections of premixed insulin per day ( $n = 157$ ). The aim was to demonstrate superior efficacy as measured by glycemic control.

Intensified insulin therapy with glargine and glulisine resulted in significantly better glycemic control (A1C change from baseline to end point,  $-0.5\%$ ;  $P = 0.0001$ ; 95% CI,  $-0.71$  to  $-0.24$ ) than did conventional therapy with premixed insulin, and was not associated with a higher rate of hypoglycemia in patients with long-standing, insulin-treated diabetes.

### The LACE Study

The LACE study, presented by F. Lee et al, was a prospective observational study designed to evaluate combination glargine/gulisine therapy and premixed insulin therapy in terms of glycemic control and medication costs. This real-world comparison of the effectiveness of basal-bolus and premixed insulin analogue therapy was conducted at 2 endocrinology practice centers in the United States. Patients with type 2 DM were randomized to treatment with glargine plus glulisine ( $n = 106$ ) or a premixed insulin analogue ( $n = 91$ ). The patients in the glargine/gulisine group had an adjusted mean A1C of 6.98% compared with 7.57% for patients in the premixed insulin group (difference,  $-0.59\%$ ;  $P = 0.009$ ); A1C reduction was 2.27% (95% CI, 1.63–2.91) for the glargine/gulisine group and 1.68% (95% CI, 1.20–2.16) for the premixed insulin group. The daily cost was \$10.82 for glargine/gulisine and \$12.06 for premixed insulin ( $\delta$ ,  $-\$1.24$ ;  $P = 0.209$ ).

A 1% reduction in A1C during the 178-day follow-up period resulted in a mean saving of \$225.54 in the glargine/gulisine group (diabetes treatment cost: \$1933.20 for glargine/gulisine; \$2158.74 for the premixed analogue).

The investigators concluded that patients with type 2 DM who were treated with glargine plus glulisine achieved better glycemic control than did patients who were treated with premixed insulin, without an increase in cost of treatment.

### IMPROVE™ Study Subgroup Analysis

R. Kawamori et al reviewed data from 30,171 patients from the IMPROVE™ study, a 26-week, international, open-label, non-randomized, noninterventive, observational study of biphasic insulin aspart 30/70 (BIAsp 30) in the treatment of type 2 DM. These investigators conducted a subgroup analysis of the safety and effectiveness of BIAsp 30 with regard to previous insulin exposure. Of the patients enrolled in the original study, 7717 (25.6%) had received no therapy before enrollment, 7470 (24.8%) had received 1 OAD, 11,139 (36.9%) had received 2 OADs, and 3727 (12.4%) had received >2 OADs. Data were missing for 118 patients (0.4%).

Overall, A1C decreased by 2.4%, from 9.4% to 6.9%, with 58.7% of all patients reaching a target A1C of  $<7.0\%$ . Among those patients who had not received pharmaceutical therapy, the improvement was even more pronounced (reduction in A1C, 3.2%).

The investigators concluded that initiating insulin therapy with BIAsp 30 significantly improved glycemic control, regardless of whether patients had previously received  $\geq 1$  OAD or any therapy. Greater glycemic control was seen in the patients who had received fewer OADs and had a shorter duration of diabetes.

### Comparative Analysis of Treatment Outcomes with Insulin Detemir and Insulin Glargine

This comparative analysis, presented by B. Alemayehu et al, used retrospective data from a large health plan in the United States to investigate patients with type 2 DM who were treated with basal insulin analogues to assess differences in glycemic control as well as diabetes-related costs.

Patients were identified if their first (index) prescription claim for detemir or glargine occurred between May 1, 2006, and December 31, 2006. Only insulin-naïve patients starting on detemir ( $n = 48$ ) or glargine ( $n = 258$ ), with or without OADs, were included. Primary outcomes included daily average consumption (DACon) of detemir or glargine, change in A1C, diabetes-related costs, and total medical costs.

No significant differences in adjusted DACon or A1C were observed between the 2 groups. However, adjusted diabetes-related costs were lower for the detemir group than for the glargine group (\$2262 vs \$3409;  $P < 0.03$ ), as were total medical costs (\$707 vs \$1510;  $P < 0.03$ ). No statistically significant difference in adjusted total medical costs was seen between the 2 groups, but the trend suggested lower costs for the detemir cohort (\$2319) than for the glargine cohort (\$3704;  $P = 0.07$ ). No statistically significant differences in overall or diabetes-related pharmacy costs were observed between the 2 groups.

### Legacy Effect in the UKPDS

R. Holman reported on the results of the legacy effect in the United Kingdom Prospective Diabetes Study (UKPDS). The investigators monitored patients after completion of the UKPDS to determine whether the improved glycemic control and lower risk of microvascular complications seen with intensive glucose therapy in patients with type 2 DM persisted after the

initial trial. Patients with newly diagnosed type 2 DM ( $N = 4209$ ) were randomly assigned to treatment with conventional therapy (dietary restriction) or intensive therapy (either a sulfonylurea or insulin, or, in overweight patients, metformin) for glucose control. In posttrial monitoring, 3277 patients were asked to attend annual UKPDS clinics for 5 years, but no attempts were made to maintain their previously assigned therapies. Questionnaires were used to assess all patients.

In the sulfonylurea/insulin group, significant reductions in relative risk persisted at 10 years for any diabetes-related end point (9%;  $P = 0.04$ ) and for microvascular disease (24%;  $P = 0.001$ ); risk reductions for myocardial infarction (15%;  $P = 0.01$ ) and death from any cause (13%;  $P = 0.007$ ) emerged over time, as more events occurred. In the metformin group, significant reductions in relative risk persisted for any diabetes-related end point (21%;  $P = 0.01$ ), myocardial infarction (33%;  $P = 0.005$ ), and death from any cause (27%;  $P = 0.002$ ).

This is just a brief highlight of the many important papers that were presented at the 2008 EASD. The 45th Annual Meeting will take place in Vienna, Austria, from September 29 to October 2, 2009. Information on this upcoming meeting is available at [www.easd.org](http://www.easd.org).