

THERAPY

Diabetic ketoacidosis, long-acting insulin analogs and pediatric type 1 diabetes mellitus

Use of the long-acting insulin analogs glargine and detemir does not reduce the risk of diabetic ketoacidosis in children and adolescents with type 1 diabetes mellitus (T1DM), compared with the use of neutral protamine Hagedorn (NPH) insulin, report a team of researchers from Germany and Austria.

Poor adherence to insulin treatment is an important contributory factor to the development of diabetic ketoacidosis in pediatric patients with T1DM. Karges and co-investigators hypothesized that the prolonged action of insulin glargine and insulin detemir might provide better protection against the development of diabetic ketoacidosis in this group of patients than NPH insulin.

“Indeed, our previous work had indicated that the use of long-acting insulin was associated with a trend to less episodes of ketoacidosis in very young children,” clarifies lead researcher

Beate Karges of the RWTH Aachen University, Germany.

In a prospective, observational study, the team evaluated the incidence of diabetic ketoacidosis requiring hospitalization in 10,682 patients aged ≤ 20 years with T1DM for ≥ 2 years.

In the cohort, 549 diabetic ketoacidosis events had occurred during a 12-month treatment period, which corresponded to an incidence of 5.14 ± 0.22 SE per 100 patient-years—a similar incidence to that found in previous studies. After adjustment for diabetes duration, HbA_{1c}, sex, insulin dose, age at diabetes onset and migration background, risk of diabetic ketoacidosis was higher for patients in the group using long-acting insulin analogs than in the group using NPH insulin (odds ratio 1.357, 95% CI 1.062–1.734). In separate analyses for insulin glargine and insulin detemir, use of either drug was associated with a higher risk of diabetic

ketoacidosis than the use of NPH insulin. Among a subgroup of patients who had poor metabolic control (HbA_{1c} $\geq 9\%$), the risk of diabetic ketoacidosis was also higher for the group treated with long-acting insulin analogs than that treated with NPH insulin (odds ratio 1.639, 95% CI 1.180–2.277).

“Contrary to our hypothesis, the use of insulin glargine or insulin detemir did not protect children and adolescents from ketoacidosis,” summarizes Karges. “As a clinical consequence, the choice of insulin should be based on other, individual considerations of the treating physician.”

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Original article Karges, B. *et al.* Long-acting insulin analogs and the risk of diabetic ketoacidosis in children and adolescents with type 1 diabetes: a prospective study of 10,682 patients from 271 institutions. *Diabetes Care* 33, 1031–1033 (2010)