Nocturnal Hypoglycemia Marker Looks Possible

BY JANE SALODOF MacNEIL

Fasting plasma glucose variability could be a marker for risk of nocturnal hypoglycemia, according to an analysis of data from more than 7,500 patients treated with insulin detemir for type 1 or type 2 diabetes.

Changes in the coefficient of variance for fasting plasma glucose (CV FPG) correlated with changes in nocturnal hypoglycemia, Dr. Leo Niskanen of Kuopio (Finland) University Hospital, and his coinvestigators reported in the journal Diabetes Research and Clinical Practice (doi:10.1016/j.diabres.2009.08.005).

When patients had less FPG variability after 3 months on insulin detemir (Levemir), the incidence of nocturnal hypoglycemia also was reduced. This was true of both types of diabetes, and was independent of improvement in metabolic control.

"Our results suggest CV FPG can be a useful marker for risk of nocturnal hypoglycemia in the clinical setting, and that glucose instability can be gauged quite simply with home FPG monitoring," the authors wrote in their conclusion.

They also speculated that reduced variability "may have contributed to the simultaneous improvement of metabolic control and reduction of nocturnal hypoglycemia observed with detemir therapy" in the study.

The analysis was based on the PREDICTIVE study (Predictable Results and Experience in Diabetes Through Intensification and Control to Target: an International Variability Evaluation), a multinational observational investigation sponsored by Novo Nordisk, maker of detemir, that had more than 19,000 patients (Int. J. Clin. Pract. 2007;61:523-8; Diabetes Obes. Metab. 2007;9:428-34).

In the analysis of the relationship between FPG variability and nocturnal hypoglycemia, there were 1,433 type 1 diabetes patients with nocturnal hypoglycemia at baseline and 2,170 without. Among patients with type 2 diabetes, 553 had nocturnal hypoglycemia at baseline, while 3,365 did not.

The incidence of nocturnal hypoglycemia at baseline and 3 months later was based on patient reports. At both time points, patients were asked whether they had had nocturnal hypoglycemic events during the previous 4 weeks.

After 3 months on detemir, the percentage of patients with nocturnal hypoglycemia decreased significantly—from 39.8% to 14.7% of patients with type 1 diabetes and from 14.1% to 3.0% of patients with type 2. The average number of nocturnal hypoglycemia events over 4 weeks also fell from 3.1 to 2.1 for type 1 patients and from 2.7 to 1.9 for type 2.

The investigators found these declines to be correlated with changes in FPG variability. At 3 months, the patients with nocturnal hypoglycemia had significantly higher CV FPG than those who did not report nocturnal hypoglycemia—32.8% vs. 23.0% in the type 1 group and 20.7% vs. 12.7% in the type 2 group.

"These absolute values were similar to baseline, although the [nocturnal hypoglycemia positive] subgroups had decreased in patient number," they wrote.

The analysis also identified demographic differences between patients who reported nocturnal hypoglycemia at baseline and those who did not. In the type 1 population, patients reporting nocturnal hypoglycemia were significantly more likely to be female (60.4% vs. 50.2%), were older (44.1 years vs. 42.2 years), had a longer duration of diabetes (18.9 years vs. 16.3 years), and had lower FPG (9.1 mmol/L vs. 9.4 mmol/L) than those not reporting nocturnal hypoglycemia.

In the type 2 population, patients reporting nocturnal hypoglycemia were not significantly different in terms of gender or age, but had a significantly longer duration of diabetes (13.7 years vs. 12.7 years), weighed less (86.2 kg vs. 91.7 kg), had a lower HbA_{1c} (7.9% vs. 8.2%), and had a lower FPG (8.9 mmol/L vs. 9.7 mmol/L).

Dr. Niskanen disclosed receiving speaker fees and research funds from Novo Nordisk. Two of his coauthors are employees of the company, and one owns shares in Novo Nordisk. ■

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