ACP Diabetes MONTHLY

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Spotlight on inpatient hyperglycemia

A new guideline offered recommendations on managing hyperglycemia in hospital patients with or without diabetes. Recent studies looked at the effects of elevated blood glucose levels after surgery and in the ICU.

The Endocrine Society recently updated its guidance on management of hyperglycemia in hospitalized non-ICU patients. The guideline, which replaces one from 2012, includes 15 recommendations. Among other advice, the expert writing panel suggested using continuous glucose monitoring (CGM) in patients at high risk of hypoglycemia and continuing insulin pump therapy in patients admitted with a pump rather than changing to subcutaneous basal-bolus insulin (if relevant expertise is available). For elective surgery patients, the guidance suggests targeting an HbA1c level less than 8% and blood glucose concentrations of 100 to 180 mg/dL (5.5 to 9.99 mmol/L). For most inpatients with hyperglycemia, scheduled insulin therapy is suggested, but dipeptidyl peptidase-4 inhibitors may be appropriate in some patients, the guidance says. Other recommendations address insulin regimens for prandial insulin dosing, glucocorticoid, and enteral nutrition-associated hyperglycemia; appropriate use of correctional insulin; and diabetes education and self-management. This guideline, which was published by the *Journal of Clinical Endocrinology & Metabolism* (*JCEM*) on June 12, will be reviewed annually to assess whether any new evidence merits revision.

A systematic review of the evidence supporting the guideline was also published by *JCEM* on June 12. It included 94 studies reporting on 135,553 patients. Conclusions of very low certainty, among others, include that using CGM increased identification of hypoglycemia and that combining neutral protamine Hagedorn with basal-bolus insulin was associated with lower glucose levels than basal-bolus alone. A preoperative HbA1C level less than 7% was associated with shorter length of stay, lower postoperative blood sugars, and fewer neurological complications and infections, but a higher number of re-operations, according to very low-certainty

evidence. Low-certainty evidence showed that treatment of inpatients with type 2 diabetes and mild hyperglycemia with glucagon-like peptide-1 agonists or dipeptidyl peptidase-4 inhibitors was associated with lower frequency of hypoglycemic events than insulin therapy. “The certainty of evidence supporting many hyperglycemia management decisions is low, emphasizing importance of shared decision-making and consideration of other decisional factors,” concluded the review authors.

The effects of postoperative hyperglycemia were analyzed in a retrospective study published by *JAMA Surgery* on June 15. It included 5,868 patients from a single medical center who underwent surgery and had blood glucose testing (4,899 without diabetes and 969 with diabetes). Hyperglycemia occurred in 91% of diabetes patients and 50.7% of patients without diabetes. Insulin was given to 72.7% of patients with a blood glucose level more than 180 mg/dL (9.99 mmol/L), 91% of those with diabetes but only 61% of those without diabetes. Hyperglycemic patients who had not been diagnosed with diabetes had higher risk of surgical complications than diabetes patients with similar blood glucose levels (odds ratios [OR], 1.83 [95% CI, 0.93 to 3.6] at a glucose level of 140 to 179 mg/dL [7.77 to 9.93 mmol/L], 1.49 [95% CI, 1.06 to 2.11] at a glucose level of 180 to 249 mg/dL [9.99 mmol/L to 13.82 mmol/L], and 1.88 [95% CI, 1.11 to 3.17] at glucose level >250 mg/dL [13.875 mmol/L]). The results support previous research finding paradoxically worse outcomes in hyperglycemic patients without diabetes versus those with diabetes, which “may be associated with underuse/inadequate use of insulin or other biological mechanisms,” the study authors said. “These findings suggest the importance of continued perioperative glycemic monitoring, especially in those patients without a known history of diabetes, and highlights areas for further inquiry.”

Finally, a study published by the *Journal of Intensive Care Medicine* on May 25 compared diabetes patients' blood glucose levels before and during their ICU stays. It included 431 patients and used their pre-admission HbA1c levels as well as blood glucose levels measured four times a day during the first seven days after admission. Patients who died within 28 days were found to have higher severity of illness scores (APACHE II and SOFA) as well as larger gaps between their average glucose level before admission (based on HbA1c) and during hospitalization (based on glucose testing). They also had higher incidence of hypoglycemia than patients who survived. The study found that a calculation based on comparing mean glucose over the first five days of admission to preadmission glycemic control was most predictive of mortality, and even more so when the SOFA score was added. ◆

Previous Next

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