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Glycemic control in hospitalized patients

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In the hospital setting, hyperglycemia is considered any blood glucose (BG) above 140 mg/dl. Patients with type 1 or type 2 diabetes mellitus (DM) are frequently admitted to a hospital, usually for treatment of conditions other than the diabetes. As the prevalence of diabetes and the prevalence of other diseases rises with increasing age, it is more likely that an older person admitted to a hospital will have DM. However, 12% of hospitalized patients have hyperglycemia without known prior history of diabetes. In that case an HbA1c should be performed and a value ≥6.5% suggests that diabetes preceded hospitalization, though an HbA1c value <6.5% suggests stress induced hyperglycemia.

A lot of retrospective and observational data indicate that poor inpatient glycemic control is associated with worse outcomes and increased morbidity and mortality in patients with or without diabetes. However, there is no evidence from randomized trials to demonstrate that tight glycemic control (BG target level of 80-110 mg/dl) in inpatients can improve outcomes. In contrast, patients who experience hypoglycemia during a hospitalization tend to have a longer length of stay. In the hospital setting, both hyperglycemia and hypoglycemia are associated with adverse outcomes, including death. Therefore, inpatient goals should include the prevention of both them.

According to current recommendations of American Diabetes Association, BG levels should be regulated at a starting threshold of 180 mg/dl. A target glucose between 140 mg/dl and 180 mg/dl appears safe and acceptable for the majority of general medicine and surgery patients in non-ICU and ICU settings. Tight glucose control may be appropriate for selected patients, as long as this can be achieved without significant hypoglycemia.

Insulin is the best way to control hyperglycemia in the inpatient setting specially in the critically ill patient. Continuous intravenous infusion is the preferred regimen for critically ill patients in the ICU and scheduled subcutaneous administration with a basal -bolus regimen with correctional insulin is the preferred method for achieving glycemic control in the non-ICU setting. Sole use of sliding scale insulin in the inpatient hospital setting is strongly discouraged. The use of oral antidiabetic agents is not recommended because the lack

of safety and efficacy studies in the inpatient setting. However, increasing evidence indicates that treatment with DPP4 inhibitors, alone or in combination with basal insulin, is safe and effective in general medicine and surgery with mild to moderate hyperglycemia. For effective and safe in-hospital BG control, a guidance protocol must be developed for each center.

The main goals in patients with diabetes needing hospitalization are to minimize metabolic disturbance, prevent acute adverse glycemic events and return the patient to a stable glycemic state as quickly as possible. There should be an effective transition to outpatient care in order to prevent acute complications and readmission. These goals are not easy to be achieved as on the one hand the stress of the acute illness raises BG but on the other hand, gastrointestinal symptoms and anorexia that are often present at hospitalized patients have negative impact on glycemic control.

The HbA1c level on admission is critical for post-hospitalization treatment. Although insulin is the most appropriate regimen during hospitalization, patients with acceptable glycemic control can continue to receive their previous treatment. There should be a structured discharge plan for each patient, especially those newly in insulin, to prevent readmission.