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Management of Diabetes Mellitus type 2 during hospitalization

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Diabetes Mellitus (DM) is a metabolic disorder that affects more than 415 million people worldwide. That means that in every 11 adults 1 has diabetes. In the hospital setting DM is more frequent affecting 1 in 4 patients but apart from that, there is also a number of patients with hyperglycemia without known prior history of diabetes. In these patients 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 caused by increased levels of counterregulatory hormones and inflammatory cytokines.

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 are no randomized trials regarding glycemic control in patients in the general medical ward. There is data from patients in the intensive care unit (ICU) but without strong evidence to demonstrate that tight glycemic control (blood glucose target level of 80-110 mg/dl) in inpatients improves outcomes. In contrast, patients who experience hypoglycemia during a hospitalization tend to have a longer length of stay. It seems that 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, a blood glucose (BG) level 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. Therefore treatment should be applied in case BG levels rise above 180 mg/dl. A tighter 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 of the lack of safety and efficacy studies in the inpatient setting. Metformin and SGLT-2 inhibitors should be used with caution because of the risk of lactic acidosis and diabetic ketoacidosis respectively. However, increasing evidence indicates that treatment with GlP-1R agonists and 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.

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.