Evaluating Glycemic Control in ICU Patients: An In-Depth Analysis of Insulin Protocol Efficacy and Hypoglycemic Events at MemorialCare Long Beach Medical Center (LBMC)

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Background/ Purpose

ICU patients face heightened risks of glycemic imbalances due to various factors such as inadequate medication regimens, stress, and comorbid conditions. The 2024 American Diabetes Association guidelines recommend a glycemic goal of 140-180 mg/dL after starting insulin therapy for critically ill patients in the ICU experiencing hyperglycemia. Following these guidelines, MemorialCare LBMC bases its current insulin regimen on targeting an optimal blood glucose level of 140-180 mg/dL and a clinically acceptable level of 100-180 mg/dL. The purpose of this research project is to analyze the effectiveness of this protocol when measuring the mean time to reach a goal within 100-180 mg/dL and the mean time to reach 4 consecutive point-of-care (POC) blood glucose readings within this target goal.

Methods

A single-center, retrospective analysis of electronic records was conducted from January to September 2023 at MemorialCare LBMC. Inclusion criteria were age ≥18, ICU stay >2 days, and active inpatient insulin therapy. Exclusions were pregnancy, imminent death, patients on insulin for diabetic ketoacidosis or hyperosmolar state, and post-cardiac surgery.

Results

The mean time to reach the target glucose was 8.25 (±4.71) hours. Approximately 67% of POC readings were within range at 24 hours, decreasing to 59% at 48 hours and 60% at 72 hours.

Conclusion

The current protocol demonstrates limited efficacy in managing blood glucose levels in ICU patients. There should be improvements in the protocol to consider a patient's current diabetes or obesity status since these factors can affect the body’s sensitivity to insulin. The protocol should also consider any previous and current medication use (e.g., steroids, vasoactive medications, parental nutrition, and enteral feed) when taking into account different effects on insulin control since these can all affect POC blood glucose values.

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