OPTIMIZATION AND IMPLEMENTATION OF A HYPERGLYCEMIC EMERGENCY MANAGEMENT ALGORITHM: IMPACT ON TIME TO RESOLUTION

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PURPOSE: The primary aim of this quality improvement project is to decrease the time from hyperglycemic emergency (i.e., diabetic ketoacidosis, hyperglycemic hyperosmolar syndrome, euglycemic diabetic ketoacidosis) resolution to initiation of a long-acting insulin regimen therapy by 25% by May 2022 at The University of Texas MD Anderson Cancer Center.

METHODS: Pre-intervention data was collected retrospectively via electronic medical records of all patients who received either an independent insulin infusion or had an order for the hyperglycemic emergency management (HEM) order set from June 1st, 2018 to August 15th, 2021. The study team evaluated compliance to the current hyperglycemic emergency management algorithm, which contains two steps. Step 1 of the algorithm consists of initiation of intravenous (IV) fluids and IV insulin. Step 2 aims to close the anion gap, return serum bicarbonate to normal levels, and initiate long-acting insulin (LAI). In addition to evaluating compliance, precipitating factors leading to hyperglycemic emergencies, time to transition to subcutaneous insulin, hyperglycemic events, hypoglycemic events, and electrolyte imbalances were also assessed. Post-intervention data will be collected on patients after implementation of the update HEM algorithm.

RESULTS: From the pre-intervention data, 132 patients were identified and 126 patients included from the pre-intervention data. Insulin was properly titrated more in step 2 than step 1 (73% vs 69%). The correct LAI dose was compliant in 14% of patients. The difference between hyperglycemic emergency resolution and initiation of LAI exceeded 12 hours in 40% of patients. After resolution of the hyperglycemic emergency, 87% of patients experienced at least 1 hyperglycemic event. Collection and analysis of post-intervention data is ongoing.

CONCLUSION: Prolonging initiation of LAI and starting LAI at inadequate doses, which led to rebound hyperglycemia, were the main factors contributing to delayed transfer from the intensive care unit. Educational presentations and algorithmic changes have been made to decrease these delays and improve the compliance and safety to the HEM algorithm. Conclusions are subject to change following the collection and analysis of post-educational intervention data.