Improving Hyperglycemia Management in the Inpatient Orthopaedic Population With a Special Focus on Mealtime Insulin Administration

Julie T. Pham, BSN RN
JPham@stanfordmed.org
Pamela Schreiber, MS RN
PSchreiber@stanfordmed.org
Stanford Hospital & Clinics

Purpose

The purpose of this evidence-based practice project was to improve the timeliness of mealtime insulin administration and decrease the incidence and severity of hyperglycemia in a population of inpatient, adult, diabetic, orthopaedic patients.

Background

Diabetes is a common comorbidity in the adult orthopaedic population. Several correlational studies have linked the presence of diabetes, and uncontrolled diabetes, to postoperative complications such as stroke, urinary tract infection, ileus, postoperative hemorrhage, wound infection, and death.[5] Key clinical processes to improve diabetes management include well-coordinated blood glucose testing and administration of insulin with meals, as well as timely adjustments to glycemic therapy based on daily blood glucose patterns.[6] Nurses are essential to these processes, but may not possess the most current knowledge on inpatient hyperglycemia management or be supported by the best processes to ensure timely mealtime insulin administration.

Methods

A small test of change was initiated on two orthopaedic units that focused on the breakfast mealtime. Three indicators were chosen to measure process improvements: point-of-care blood glucose values, the time at which the nurse obtained the blood glucose value, and the time in which mealtime insulin was administered. Surveys completed by nurses questioned their baseline knowledge of and experiences regarding the mealtime insulin administration process. A 30-day period of change was then implemented with two initiatives: (1) mealtime insulin administration process improvements, and (2) a nursing education program. Process improvements included: nurse page alerts of meal trays en route to unit, improved supply of insulin vials, equal distribution of diabetic patients among nursing assignments, and posting meal times in patient rooms. The nursing education program covered three topics: mealtime insulin administration, hyperglycemia management, and patient education. Information was disseminated through signage throughout the unit, weekly emails, one-on-one discussions, and placards placed in glucometer kits.

Results

The post-implementation nursing survey revealed many improvements. 71% of nurses self-reported giving insulin on time “most of the time”, as compared to 53% of nurses at baseline. 72% of nurses responded that their patients “rarely” or “almost never” started eating prior to the blood glucose check, compared to 21% at baseline, Additionally, 67% of nurses found the mealtime announcement pages “very helpful” and reported receiving the pages 77% of the time. Compared to baseline, percent of hyperglycemic patient blood glucose values did not improve significantly. There was also no improvement seen in attaining the standard of less than one hour

between point-of-care blood glucose testing and mealtime insulin administration. Improvement was seen, however, in the reduction of early aspart insulin administration from 35% to 15%.

Discussion

Decreases in the incidence and severity of hyperglycemia were not achieved yet, but given the multifactorial nature of blood glucose during a patient's hospital stay, further changes from a multidisciplinary effort might be necessary to impact this measure. The process improvements, especially the mealtime announcement page, were reported to be very helpful in improving nurses' ability to give insulin on time. Based on this project, diabetic patients can greatly benefit from a process in which nurses are notified of meal arrivals.

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