Evaluating the Effect of EndoTool Utilization for Glycemic Control in Critically Ill Patients

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Introduction

- EndoTool IV (ETIV) is an algorithm that dictates insulin-dosing regimen based on blood glucose values
- It was initiated to reduce and even eliminate redundancies and human errors, this algorithm has improved hypoglycemia rates and avoided errors in insulin dosing
- This study analyzes patient outcomes for a comparable three-month period pre- and post-implementation of ETIV in two critical care units at UPMC Central PA

Methods

- A retrospective study done to compare patients who were managed on an insulin drip pre- and post-ETIV implementation at the UPMC Central PA hospitals. Data was obtained from Epic EMR over 2 months
- Pre-ETIV implementation group included 125 patients and post-ETIV implementation group included a total of 162 patients
- Inclusion criteria consisted of adult patients hospitalized who required an insulin drip
- The primary outcome was the time (days) on insulin drip
- Secondary outcomes included hypoglycemic events, length of hospital stay, readmission rate, electrolyte management

Results

- Post-ETIV implementation showed statistically significant reduction in time on insulin infusion, average time to reach goal blood glucose of 140 , and rate of hypoglycemic events with blood glucose < 70
- Also demonstrated a reduction in ICU length of stay , hospital length of stay, cost of ICU charges per patient, although not statistically significant

	MAY - JULY 2022		SEPTEMBER - DECEMBER 2022	
Metrics	Pre- Implementation	Pre-Implementation Standard Deviation	3 months Post-Implementation	Post-Implementation Standard Deviation
Total Patients	125 total		162 total	
Average Age	65.6 years	11.8	64.5	11.3
Average ICU LOS (Days)	5.3	5.6	4.76	4.85
Average Hospital LOS (Days)	11	9.9	8.6	4.49
Average Time on Infusion (Hours)	58.16 hours	57:00	41.4	24.5
Average ICU Charges	$42,032 av per patient	$50,681	$32,162	$37,223
Average #BG checks while on drip	67 on average	49	31.2	26.6
Average Time to Goal of 140 (Hours)	18:15	13:02	4.7	4.76
% of values < 70	2.11%	168/7957	0.530%	27/5058
% of values < 40	0.14%	11/7957	0.000%	0/5058

Discussion

- There was a fourfold reduction in hypoglycemia less than 70mg/dl and the complete elimination of severe hypoglycemia (blood glucose less than 40 mg/dl).
- Reduction in the average time required to achieve blood glucose targets, reducing the progression of DKA and hastening patient's recovery
- ETIV offers advantages such as simplifying insulin dosing, reducing the cognitive load on clinicians and possibly reducing errors
- By offering an individualized dosing regimen based on a patient's specific conditions, it also has the potential to improve patient care
- Given the increasing prevalence of diabetes and its complications, innovative solutions like ETIV are critical in managing these patients and improving their prognosis

References

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