Incidence of Perioperative Hyperglycemia in Colorectal Surgery Patients in ERAS Protocol

Lawrence T. Volz, MD, FACS, Emily Volz

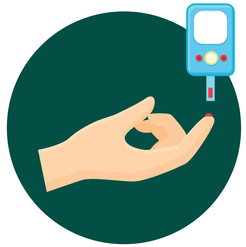
Introduction

Multiple studies have shown an increase in morbidity and mortality in non-diabetic surgical patients with hyperglycemia. The incidence of hyperglycemia in patients who have received carbohydrate loading in the setting of an ERAS protocol is not known. Secondly, if hyperglycemia is identified in non-diabetic patients, the safety of treatment with exogenous insulin in this population is not proven.



Methods

Between March 15, 2016 and April 1, 2020, all elective colon resection patients for 1 surgeon underwent routine blood sugar checks in PACU and TID AC-HS for the first 48 hours after surgery or until discharge time if they left before 48 hours. A total of 120 patients underwent elective robotic colon resection utilizing an ERAS protocol during the study period. Patients with hyperglycemia (BG>149) were treated with a sliding scale insulin protocol with regular insulin. Blood sugar results and outcomes were evaluated retrospectively.



Results

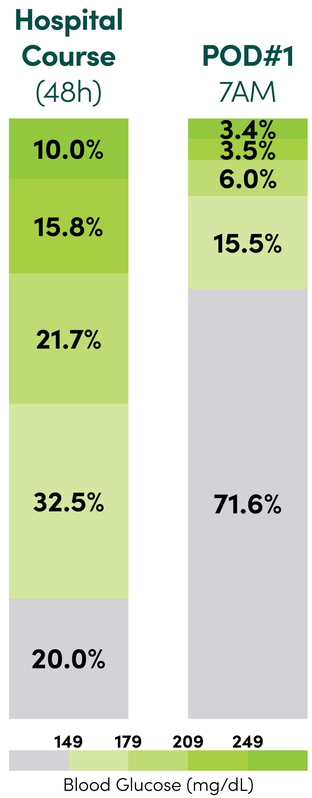
96 of the 120 patients (80%) developed hyperglycemia (BG>149) during their postoperative course. The incidence of blood sugars at 7AM the morning after surgery revealed an incidence of hyperglycemia (>149) of 28.4%. There were 118 elevated blood sugars recorded in the non-diabetic patients with 81 (68.6%) receiving insulin as ordered. The overall incidence of complications including readmissions was 14.2%. There was significant hyperglycemia in this complication group with over 21.3% of non-diabetic patients having a blood glucose over 209. The highest incidence of hyperglycemia occurred within the first 24 hours after surgery. There were 6 patients that developed hypoglycemia (BG<80) but none of these episodes were symptomatic, received treatment or had received insulin within the previous 6 hours.

120
total number of patients who underwent elective robotic colon resection utilizing ERAS protocol

96
total number of patients who developed hyperglycemia during postoperative course



BG	Hospital Course	POD#1
>149	80%	28.4%
>179	47.5%	12.9%
>209	25.8%	6.9%
>249	10%	3.4%



Conclusion

This study is limited by the small patient numbers but reveals the incidence of hyperglycemia in patients undergoing robotic colorectal surgery in an ERAS protocol is underestimated in non-diabetic patients. These results suggest that it is safe to treat non-diabetic patients with perioperative hyperglycemia with sliding scale insulin without risk for clinically significant hypoglycemia. The final conclusion suggests utilizing 7AM blood sugars as a marker for perioperative hyperglycemia may fail to identify over 50% of patients with hyperglycemia. The impact of treating hyperglycemia in non-diabetic patients on surgical outcomes in this population will require further evaluation.

>50%
of patients with hyperglycemia may not be identified utilizing 7AM blood sugar marker