

Postoperative Serum Glucose Levels: A Risk Factor for Surgical Site Infections In Patients Undergoing Colorectal Surgery



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Introduction

- Surgical site infections (SSI) account for over 20% percent and are one of the most common types of hospital acquired infections.¹ Colorectal SSIs are defined by the CDC as superficial, deep or organ-space and occur within 30 days after surgery in the general area of the body where the surgery took place.²
- Postoperative hyperglycemia is one risk factor that has been demonstrated to increase SSIs in cardiac procedures, but the link to colorectal surgeries is not as well characterized.³
- We evaluated postoperative colorectal surgical patient's serum glucose levels and statistically analyzed this data in order to determine whether an association of high serum glucose levels and SSIs exists.

Methods

- A total of 160 patients comprised the study population, which consisted of 80 patients that were identified through routine surveillance with either a deep, superficial or organ-space SSI from January 1, 2013 to December 31, 2014. Age-matched controls were selected on a 1:1 ratio from the denominator of patients undergoing colorectal surgery who did not develop an SSI.
- Controls were matched for age (± 6 years), sex, American society of anesthesiology (ASA) score, and duration of surgery (± 35 minutes). The exposure variable was defined as the average of serum glucose levels on post-operative day one and two (POD1 and POD2).
- An independent sample t-test was conducted to compare the average of POD1 and POD2 serum glucose levels in the SSI group to the no SSI group. Statistical analysis of less than 0.05 were considered significant.

Results

Mean Serum Glucose Levels In SSI Group Compared to No SSI Group

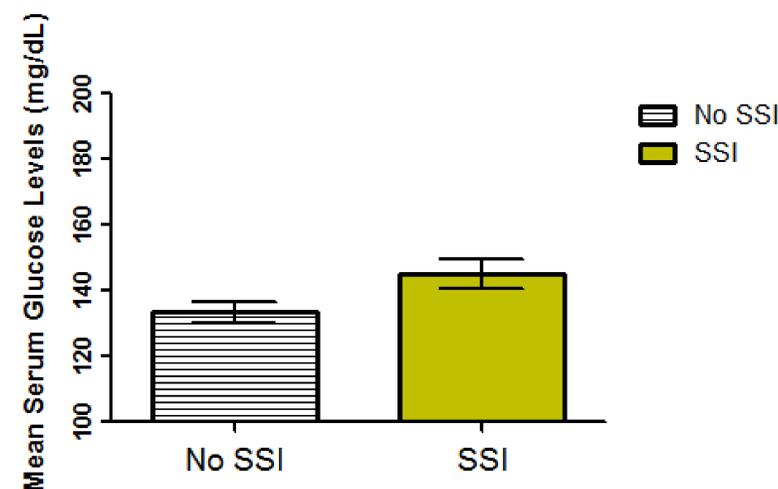


Figure 1: Shows the mean serum glucose level of the average of POD1 and POD2, 145.12 mg/dL and 133.47 mg/dL of the SSI and the control group respectively.

Serum Glucose Levels of Patient with and without SSI

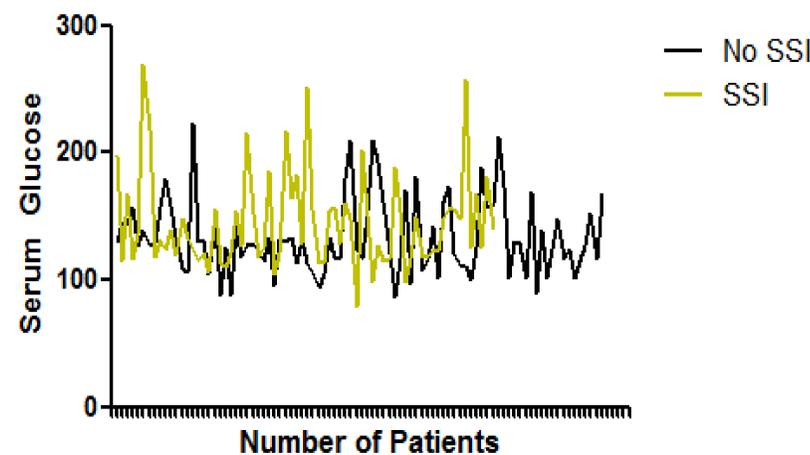


Figure 2: Shows the statistically significant difference in the mean serum glucose level of POD1 and POD2 for each patient in the SSI group and the control group.

Conclusions

- When averaging POD1 and 2 glucose levels, SSI patients had a statistically significant higher serum glucose level compared to those without SSI, suggesting that high post-operative serum glucose levels may be an independent risk factor for SSIs in patients undergoing colorectal procedures. These data are consistent with findings reported for diabetic patients undergoing colorectal surgeries as well as those undergoing cardiac procedures.
- Controlling post-operative serum glucose levels in colorectal surgeries has broad implications for reducing morbidity and the length of post-operative hospital stay.
- We advocate that glucose control be implemented as part of a bundled intervention which could easily be performed using minimal additional resources and is unlikely to cause harm. Quantifiable outcomes may include decreased morbidity lower costs, and lower length of stay.
- Our studies have the following limitations: a small population size and the lack of control for additional variables that are important to the outcomes of patients undergoing colorectal surgical procedures. As a result, additional studies should be performed.

References

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