

Perioperative Hypothermia in the Presence of Poor Glycemic Control Increases the Risk of Surgical Site Infection

Henry Liedl¹, Kevin Allen Lazenby, Ryuji S Arimoto, Armaan Singh, Jason Strelzow

¹Orthopaedic Surgery, University of Chicago - Pritzker School of Medicine

INTRODUCTION: Surgical site infection (SSI) is the leading cause of nosocomial infections among surgical patients in the U.S. Currently, there is compelling evidence suggesting temperature dysregulation in surgical patients may be a risk factor for the development of SSI. We examined the relationship between perioperative hypothermia (PH) and SSI in a population of surgical patients with diabetes mellitus (DM).

METHODS: This retrospective chart review was conducted of patients with a history of DM undergoing elective orthopedic surgery at our teaching institution between May 1, 2018, and April 1, 2022. Surgeries were performed within a single hospital. Inclusion criteria were age greater than 15, history of DM or recent hemoglobin A1c (HbA1c) concentration of $\geq 6.5\%$, and an elective orthopedic operation of at least 60 minutes under general anesthesia. Poor glucose control was defined as a HbA1c level $\geq 6.5\%$ at the time of surgery, and perioperative hypothermia (PH) was defined as having intraoperative temperature ≤ 35.5 °C. Continuous variables were compared using the t-test and Wilcoxon rank sum test. Categorical variables were compared using the chi-squared test. We constructed a multivariable logistic regression model to estimate SSI risk while controlling for demographic variables.

RESULTS: 252 patients were included in the final analysis. 102 (40.5%) patients experienced perioperative hypothermia. The overall incidence of SSI was 5.95%. Among the 102 patients who experienced PH, poor glycemic control was associated with an increased risk of SSI (OR = 2.27, 95% CI = 1.08-4.89, p-value = 0.027). Among patients with PH, the multivariable logistic regression model had good discrimination at a predicted probability threshold of 6% (AUC 0.86, sensitivity 83.3%, specificity 78.1%, PPV 19.2%, NPV 98.7%).

DISCUSSION AND CONCLUSION: Poor glycemic control in the presence of perioperative hypothermia was associated with increased odds of surgical site infection. Poor glycemic control may modify the effect of perioperative hypothermia to increase the risk for surgical site infection.