Improving Perioperative Temperatures Using Thermal Space Blankets

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Abstract

Introduction: The aim of this study was to determine the effect on perioperative temperatures when using the thermal space blanket instead of the bair-hugger device in addition to the normothermia protocol for temperature management. The normothermia protocol includes prewarming the operating rooms, prewarming the intravenous fluids and utilizing the bair-hugger device to prewarm patients. According to the statistical analysis of perioperative temperatures, only 52% of colorectal patients are normothermic in the operating room. The improvement of perioperative temperatures may improve patient outcomes, decrease surgical complications, decrease the duration of hospitalizations, decrease hospital readmissions and improve patient satisfaction.

Method: All the consecutive 217 patients who underwent scheduled colorectal surgery between September 2017 and August 2018 were admitted to the study. The nasopharyngeal temperature was measured in the operating room and the temporal artery temperatures were measured in the preoperative unit and the postoperative unit. The following variables were also recorded: age, sex, weight, type of surgery, length of surgery, blood loss from surgery, duration of the procedure, preoperative temperatures, intraoperative temperatures, preoperative temperatures, complications from surgery, length of hospital stay, and whether the bair-hugger was used or the thermal space blanket. Independent t test, dependent t test, and chi-squared test were performed to assess the difference in perioperative temperatures.

Results: When performing an independent t-test, the thermal space blankets showed a significant difference in prewarming patients in the preoperative area compared to the bair-hugger device with mean temperatures 0.5 degrees Celsius higher (0.00067). The thermal space blankets, when used preoperatively and postoperatively for temperature management, did not show improvements in average intraoperative temperatures (p=0.53), the lowest recorded intraoperative temperature (p=0.51), the last recorded intraoperative temperature (p=0.52) or the immediate postoperative room temperature (p=0.11). A chi squared analysis using a significance level of 0.05 to compare arrythmia complications from surgery (p=0.07), whether the patient was readmitted in 30 days post procedure (p=0.13) as well as the length of hospital stay (p=0.41) between the thermal space blanket and the bair-hugger device did not show a significant difference between the two groups.

Conclusion: The thermal space blankets showed improvement in prewarming preoperatively but did not show improvements in intraoperative temperatures, postoperative temperatures, complications, length of hospital stay, or readmissions. The conduction of this quality improvement study on the normothermia protocol to evaluate an innovative method of warming patients using the thermal space blanket compared to the bair-hugger device did not show statistically significant differences between the two warming methods overall and does not indicate replacing the bair-hugger device with the thermal space blanket perioperatively. Organizations should consider applying a minimum requirement to all temperature management
protocols to prewarm patients for 60 minutes in the preoperative unit that has shown overall improvement in perioperative temperatures. This quality improvement trial did not have the capability to require a minimum duration for prewarming prior to surgery.