Efficacy of an Underbody Forced-Air Warming Blanket for the Prevention of Intraoperative Hypothermia

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Background: Hypothermia commonly occurs during major surgery and can be associated with perioperative complications, such as postoperative myocardial ischemia and an increased rate of surgical wound infections. There are various methods for preventing hypothermia including forced-air warming systems that have been shown to be effective (1). However, forced-air systems that use conventional blankets which only partially cover the patient from above cannot prevent initial decrease of core temperature caused by redistribution completely. Recently, a new type of forced-air warming blanket has been developed which is used by placing it under the body of patients (Model 635 Full Access Blanket – Arizant Healthcare). In this investigation, we evaluated the efficacy of this blanket in preventing hypothermia during upper abdominal surgery.

Methods: Twenty patients undergoing elective upper abdominal surgery were enrolled following written consent and were randomized into two groups; (1) the forced-air warming (43°C) group using underbody blanket (underbody blanket group), and (2) circulating water mattress (43°C) group (control group). Anesthesia was maintained with combined thoracic epidural and sevoflurane anesthesia. Esophageal and bladder temperature were taken shortly after the induction of general anesthesia and at 15-minutes intervals for 120-minutes following induction. Ambient temperature in the operating room was set to 24°C during the trial. Data was expressed as mean \(\pm SD\). Statistical analysis was performed using ANOVA and post hoc Bonferroni/Dunn or Scheffe’s F test. \(P<0.05\) was considered significant.

Results: There were no significant differences in age, weight, height, and body mass index of patients between the two groups. Esophageal temperature decreased significantly throughout surgery in the control group. However, esophageal temperature did not change significantly throughout surgery in the “underbody” blanket group. Maximum decrease of the esophageal temperature was \(0.24\pm0.30°C\) and \(0.91\pm0.44°C\) in the “underbody” blanket and control group, respectively. (Fig)

Discussion and Conclusion: We demonstrated that forced-air warming system using the “underbody” blanket was effective to prevent hypothermia during upper abdominal surgery. Additionally, this device could also prevent the initial temperature decrease caused by redistribution, and our results are not consistent with previous observations (1). We consider that the “underbody” blanket, compared with “upperbody” blanket (the most popular blanket used for forced air warming that covers the upper extremities from the “over” side of the body), can warm larger body surface area not only upper and lower extremities, but also the lateral sides of the trunk that contributes to maintain normothermia.

References: (1)Anesth Analg 2003; 96: 1683.[figure1]

Anesthesiology 2007; 107: A91

![Figure 1](image1)

**Fig. Changes in esophageal temperature**