

Effectiveness of a circulating-water warming garment in rewarming after pediatric cardiac surgery using hypothermic cardiopulmonary bypass

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Abstract

Objective: To evaluate the effectiveness and safety of the **ALLON** 2001 microprocessor-based thermoregulation system in pediatric patients undergoing cardiac surgery requiring hypothermic cardiopulmonary bypass compared with the routine thermal care.

Design: Prospective randomized clinical study.


Setting: Single tertiary academic medical center.

Participants: Infants (0–1 year) who underwent congenital heart surgery requiring hypothermic cardiopulmonary bypass (n = 18). Patients with open wounds and/or patients treated with an investigational drug or device within 30 days of surgery were excluded.

Interventions: Randomized use of thermoregulation system (warming garment, N = 9) or routine thermal care (control, N = 9) after separating from cardiopulmonary bypass until the arrival to the pediatric intensive care unit (PICU).

Measurements and Main Results: There were no statistically significant differences in the demographic data, cardiopulmonary bypass time, operating room time, incidence of deep hypothermic circulatory arrest, and cooling temperature between the groups. The nasopharyngeal temperature was significantly higher in the warming garment group after separation from cardiopulmonary bypass. Nasopharyngeal temperature at 20 minutes was 36.5°C versus 35.01°C ($p = 0.0047$), at 40 minutes was 36.98°C versus 35.30°C ($p = 0.034$), and at admission to the PICU was 36.09°C versus 35.31°C ($p =$ not significant). There was no difference in the core-to-peripheral temperature gradient (nasopharyngeal-to-skin temperature) between the 2 study groups at any time point. No adverse events related to the use of the warming garment thermoregulation system were observed.

Conclusion: The investigated thermoregulation system was effective in preventing the after-drop of temperature that occurs after cardiopulmonary bypass in small infants compared with routine warming methods.

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