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The Effect of Short-Term Periods of Pre-operative Warming in the Prevention of Peri-operative Hypothermia

Clinical study

AUTHORS

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CENTER AND COUNTRY

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TYPE OF STUDY

Proposed, Randomized

STUDY OBJECTIVE

The aim of the study was to evaluate the performance of different durations of active pre-operative skin-surface warming (pre-warming) to prevent peri-operative hypothermia and postoperative shivering. 200 patients were randomly assigned, scheduled for surgery of 30-90 minutes under general anesthesia, to receive passive insulation or forced-air skin surface warming for 10, 20 or 30 minutes.

METHODOLOGY

200 healthy adult patients undergoing elective surgery under general anesthesia: laparoscopic cholecystectomy; inguinal hernia repair; breast surgery; minor orthopaedic surgery; and ENT surgery with expected duration > 30 minutes, but < 90 minutes. Patients were not studied if they were < 18 years old, classified as ASA physical status 3 or higher or planned for combined general/regional anaesthesia. Body temperature was measured at the tympanic membrane. In accordance with the current guidelines, hypothermia was defined as a core temperature 36°C/96.8°F.

Shivering was graded by visual inspection. Postoperatively, shivering was graded by an investigator blinded to patients' core temperatures and group assignments using a four-point scale (0 = no shivering; 1 = intermittent, low-intensity shivering; 2 = moderate shivering; 3 = continuous, intense shivering).

STUDY RESULTS

There were significant difference in changes of core temperature between the non-pre-warmed group and all the pre-warmed groups ($p < 0.00001$), but none between the three pre-warmed groups ($p = 0.54$).

Without pre-warming, 38/55 (69%) of patients became hypothermic (<36°C/96.8°F) at the end of anaesthesia, whereas only 7/52 (13%), 3/43 (7%) and 3/50 (6%) of patients following 10, 20 or 30 minutes pre-warming, respectively, became hypothermic ($p < 0.001$ vs no pre-warming).

Shivering was observed in 10/55 (18%) of patients without pre-warming, and in 3/52 (6%), 3/43 (7%) and 1/50 (2%) of patients with following 10, 20 or 30 minute pre-warming, respectively ($p = 0.02$ vs no pre-warming).

	No pre-warming (n = 55)	10 minutes of pre-warming (n = 52)	20 minutes of pre-warming (n = 43)	30 minutes of pre-warming (n = 50)
Active warming required during surgery	37 (67%)	16 (31%)[1]	1 (2%)[1,2]	3 (6%)[1,2]
Hypothermic at start of PACU	38 (69%)	7 (13%)	3 (7%)	3 (6%)
Shivering in PACU	10 (18%)	3 (6%)[1]	3 (7%)[1]	1 (2%)[1]

PACU, postoperative care unit; [1]$p < 0.05$ vs 0 minutes warming; [2]$p < 0.05$ vs 10 minute warning.

DISCUSSION

Core temperature of patients who were not pre-warmed declined more than with pre-warming, despite active warming during the procedure. In the pre-warmed groups, the need for intra- and post-operative warming was lower, and the duration was shorter than in the patients who were not pre-warmed. Starting active warming intra-operatively for the first time after the core temperature has already decreased below <36°C/96.8°F does not reduce or prevent further hypothermia.

FULL ARTICLE AVAILABLE AT

http://onlinelibrary.wiley.com/doi/10.1111/i.1365-2044.2012.07073.x/full

CONCLUSION

Pre-warming of patients before general anesthesia prevents hypothermia and reduces shivering. In this study, pre-warming time did not influence changes of core temperature.

PUBLICATION OF PRESENTATION

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