Comparison between Forced Air and Intravenous Fluid Warmer in Gynecologic Laparoscopic Surgery

Warunee Boayam, B.SN*, Phongthara Vichitvejpaisal MD, PhD*, Pawan Suton, B.SN*, Sarisa Tapala , B.SN**

Background

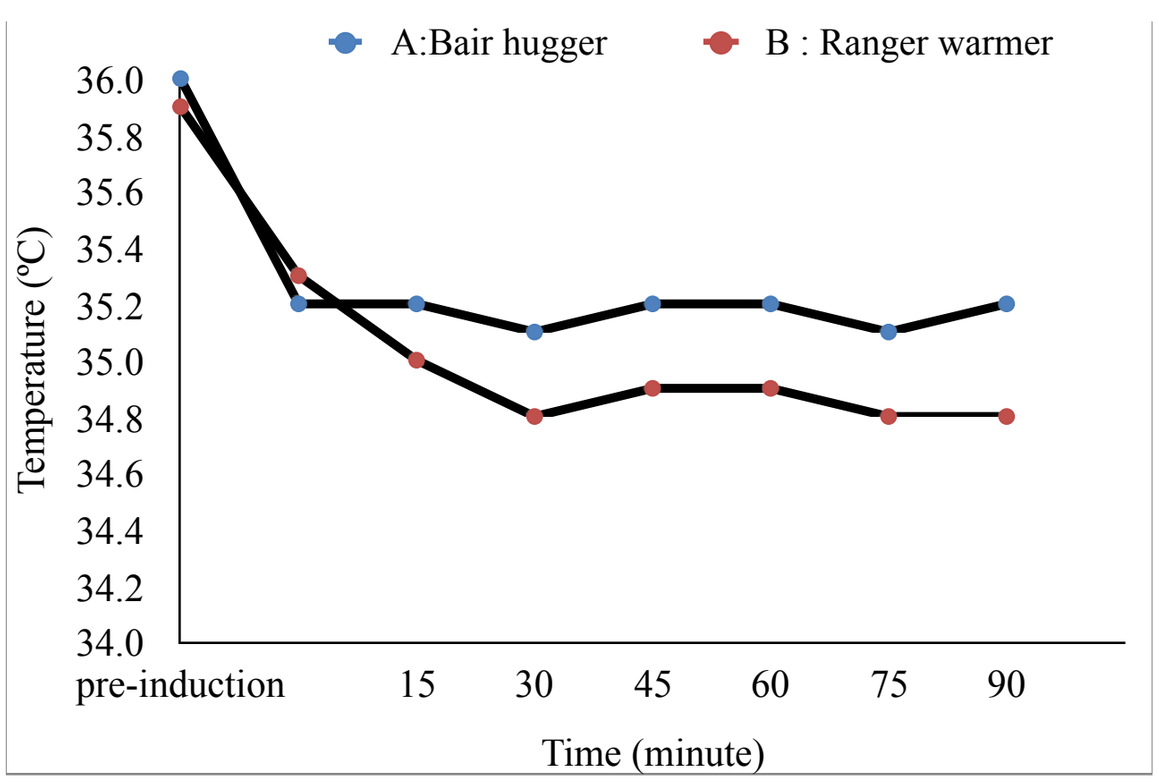
Patients undergoing gynecologic laparoscopic surgery frequently experience with hypothermia . This can cause myocardial ischemia, surgical site infection and coagulopathy. The reasons why patient has this event are the reduced metabolic heat production, redistribution of heat from the core to the periphery, impaired thermoregulation (due to anesthetics), use of cool insufflations carbon dioxide gas and surgical irrigation solution, as well as heat loss due to the cool environment. Most anesthesia personnel warm patient peri-operatively by using force air warmer and intravenous fluid warmer. This study aimed to compare the difference of core and room temperature in patients undergoing gynecologic laparoscopic surgery by using forced air and intravenous fluid warmer

Material and Method

A prospective experimental study was conducted with 90 patients who underwent elective gynecologic laparoscopic surgery. All patients were randomized into two groups, in group A, patients were actively warmed after induction period by forced air-warming at 43 ^{0}C, group B received intravenous fluid warmer at 41 ^{0}C by Ranger warmer. Core temperature (tympanic membrane) and room temperature were recorded every 15 minute after the induction period.

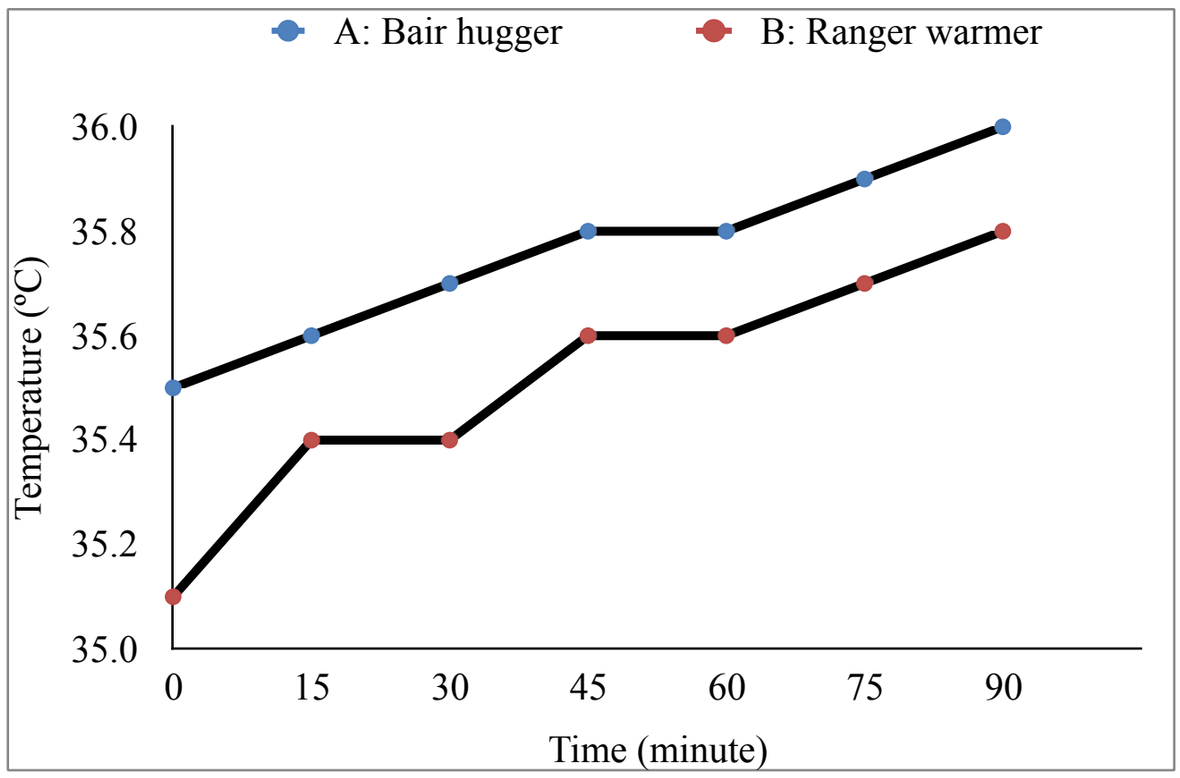
Results: Interim analysis (group A : 29, group B : 23)

Intra-operative tympanic membrane temperature were higher in the active warming (Group A) compared with intravenous fluids warmer (Ranger warmer) at 15 minutes interval after induction of anesthesia. In the recovery room, the core temperature was higher in group A than that of group B. Nevertheless, there were insignificant differences in temperature between groups.



Core temperature	Group A	Group B	p
0 minute	35.2±0.6	35.3±1.0	0.730
15 minute	35.2± 0.8	35.0±0.9	0.384
30 minute	35.1±0.7	34.8±0.8	0.071
45 minute	35.2±0.9	34.9±0.8	0.244
60 minute	35.2±0.9	34.9±0.8	0.255
75 minute	35.1±0.7	34.8±0.9	0.169
90 minute	35.2±0.8	34.8± 1.0	0.143

Figure 1-2. Intra-operative Data. Mean temperature in patients receiving forced air warming (Bair hugger) versus intravenous fluid warmer (Ranger warmer)



Core temperature	Group A	Group B	p
0 minute	35.5±0.6	35.1±0.7	0.256
15 minute	35.6±0.7	35.4±0.8	0.366
30 minute	35.7±0.6	35.4±0.7	0.110
45 minute	35.8±0.6	35.6±0.7	0.284
60 minute	35.8±0.5	35.6±0.6	0.271
75 minute	35.9±0.5	35.7±0.7	0.169
90 minute	36.0±0.6	35.8±0.7	0.218

Figure 3-4. Mean postoperative data in the recovery room.

Recovery room	Group A	Group B
Warmed blanket	0	4 (17.4%)
Pethidine	0	0

Figure 5. Treatment for shivering.

Discussion

The demographic data of both groups were similar. After induction, group A and B insignificantly showed to decrease in temperature and appeared to maintain at steady stage throughout the procedure with a little bit higher in Group A. This might due to the forced air warmer yielded a circulating, temperature flow; while, warmed intravenous fluid lost heat en route to the patients. Therefore, in a cool operating theatre, the distance between administered fluid and site of intravenous cannulation should be short as much as possible. Nevertheless, the core temperature of both groups showed insignificant differences in the recovery room, as all participants were covered by blanket in a warmed atmosphere.

Conclusion

The active warming with forced air warmer might be more efficient than intravenous fluids warmer (Ranger warmer). However intergroup differences were unremarkable.

Professor Phongthara Vichitvejpaisal MD, PhD.

Department of Anesthesiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, THAILAND
Email:phongthara@gmail.com