The impact of prewarming on core temperature and cases of inadvertant perioperative hypothermia in oncogynecological surgery

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Background: Inadvertent perioperative hypothermia (IPH) occurs in many patients, undergoing oncogynecological operations, due to the influence of the spinal anesthesia and sedation. Preoperative warming prevents the drop of the core temperature [1]. Tramadol can facilitate the postoperative muscle shivering and improve comfortable condition of the patients [2]. According to the latest recommendations, the preoperative warming is sufficient if the duration of the operation is less than one hour (expert consensus) [3].

The aim of the study: We tested the efficiency of the preoperative forced-air warming (FAW) device (Bair Hugger) in combination with intravenous injection of tramadol in preventing IPH for patients, who were undegoing spinal anesthesia for elective cancer gynecological surgery, lasted less than one hour.

Materials and Methods: The study was approved by the Kazan Medical Academy ethics committee. One hundred twelve adults, ASA physical status I and I I patients, who were undergoing spinal anaesthesia for elective cancer gynecological surgery were recruited to the study after giving written informed consent. From 112 patients, 32 patients were excluded, because of excessive surgery duration or using endotracheal intubation intraoperatively. Randomisation was performed by an uninvolved nurse on arrival at the preoperative care unit by rolling a dice; a roll of odd numbers resulted in enrolment to the ‘no warming’ group, even numbers meant allocation to the ‘prewarming + tramadol ’ group. The “prewarming + tramadol” group consisted of 40 patients, who were prewarmed for 30 minutes before the spinal blockade by the FAW device BairHugger connected to the blanket 3M 30000 model with air temperature 43°C. These patients received 0.5 mg/kg tramadol intravenously before incision as well. The control group included 40 patients, who received the regular treatment. The values of the patients are presented in the Table №1. There were no considerable difference between groups.

VALUE	PREWARMING + TRAMADOL GROUP	CONTROL GROUP
Number of patients	40	40
Duration of surgery (min.)	58.5±8.5	58.0±7.2
Age	58.9±8.3	59.7±9.2
Body-weight index (kg/m²)	29.2±2.6	29.1±2.1
Intravenous infusion (ml)	1890±204.8	1980±347.3
Blood loss (ml)	118±20.5	106±25.7

Central temperature was measured every 15 minutes since arriving to the operation room by using infrared tympanic thermometer (WF 1000; BWell, UK). We registered nausea, vomiting, muscle shivering, duration of active warming postoperatively. All data were stored and analyzed bye the BIOSTAT 3.01 version. We used t-Student test to compare patients’ values and perioperative temperature and x2 test to compare proportion between normothermic and hypothermic patients inside the groups. Results: There was smaller decrease of mean core temperature in the prewarmed group at 15, 30, 75, 90 min post-induction (P < 0.05).

By the end of the operation all patients from the control group remained hypothermic, whereas only 28 patients (70%) remained hypothermic in the prewarmed group (P < 0.05). 26 (65%) patients from the control group and 10(25%) patients in the prewarmed group suffered from muscle shivering (P < 0.05).

There were no significant differences in vomiting and nausea between the groups.

VALUE	PREWARMING + TRAMADOL GROUP	CONTROL GROUP
Duration of the active postoperative warming (min)	10±8.5	22±7.2*
Shivering n(%)	10(25%)	26(65%)*
Nausea n(%)	6(15%)	4(10%)
Vomiting n(%)	1(2,5%)	0(0%)

Conclusions: Preoperative warming using the Bair Hugger, combined with preoperative injection of tramadol results in smaller decreases in core temperature intraoperatively and less IPH in patients undergoing oncogynecological surgery under spinal anesthesia. Taking into account high rates of postoperative hypothermia in both groups, we consider the prewarming as a possible preventing measure.

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