

Effect of preoperative forced-air warming (PREWARM) on intraoperative tissue oxygenation, microperfusion and body core temperature in patients with ovarian cancer undergoing major cytoreductive surgery

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Background: Cytoreductive surgery is associated with extensive fluid resuscitation, inadvertent periop. hypothermia and high dose usage of vasopressors which may alter intraop. tissue oxygenation (StO₂), microperfusion and subsequently reduce postop. outcome. We hypothesize that preop. forced-air warming (PW) may help to prevent intraop. hypothermia as a prerequisite to improve StO₂ and microperfusion.

Material and Methods: After ethics approval 47 women scheduled to have cytoreductive surgery were prospectively enrolled. All women received a thoracic PDA, an arterial line, a central venous catheter during induction of GA and intraop. forced-air warming. According to their randomization women were treated with either 30 min. of 43°C PW (Gr. 1, Fig 1A), PW + subcutaneous microdialysis (MD, Gr. 2, Fig 1B), MD without PW (st/MD, Gr. 3) or no intervention (st., Gr. 4). StO₂, central venous-arterial carbon dioxide difference (dCO₂) and ethanol ratio via MD for microperfusion and core temp. (hourly) were defined as primary outcome. Additionally, hemodynamic parameters (MAP, CVP, HF, norepinephrine) and glucose, lactate and glycerol in MD were obtained. Statistical analysis was performed using the Mann-Whitney-U-Test and non-parametric-longitudinal analysis.

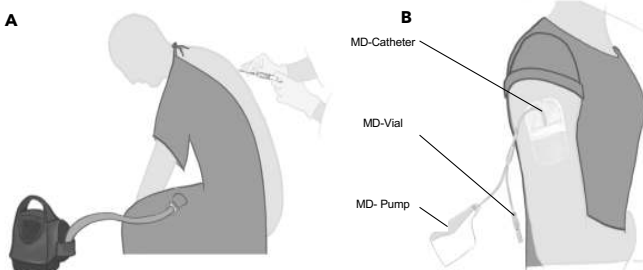


Fig.1: A) Forced Air Prewarming during PDA; B) Subcutaneous Microdialysis (MD);

Results: No significant differences in StO₂ of 86.0% (84.0-88.0) in Gr. 1+2 (n= 24) compared to 84.0% (80.0 - 87.5) in Gr. 3+4 (n=23) were detectable at 60 min and over the entire intraop. Period (Fig. 2). The dCO₂ at 60 min (Gr. 1+2: 6.3mmHg (5.4 - 7.8) vs. Gr. 3+4: 5.7mmHg (4.7 - 6.9)) and over the entire intraop. period remains without significant differences.

In MD the ethanol ratio in Gr. 2 (n= 7) is fairly constant at 0.4 compared to a slight decrease from 0.45 to 0.25 in Gr. 3 (n=7). Lactate, glucose and glycerol in Gr. 2 tend to be more constant over the entire period without significant differences to Gr. 3 (Fig.3)

The median core temp. of 36.7°C (36.6-36.9) in Gr. 1+2 at 60min was significantly (p<0.001) increased compared to 35.8°C (35.5 - 36.2) in Gr. 3+4 (Fig. 4). A significant intraop. temperature gap of 0.8°C (p< 0.001) between both groups was registered in. Hemodynamic parameters showed no significant differences between the groups.

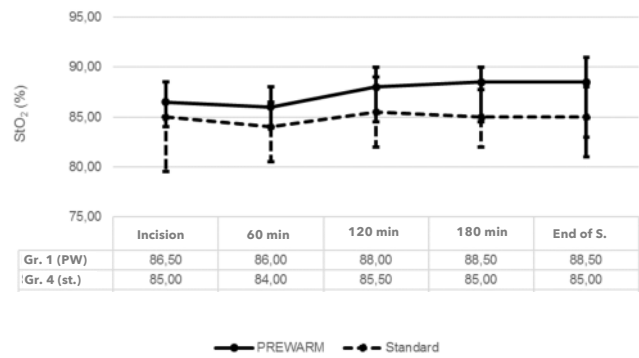


Fig.2: Tissue Oxygenation (median/quartil: 25%; 75%)

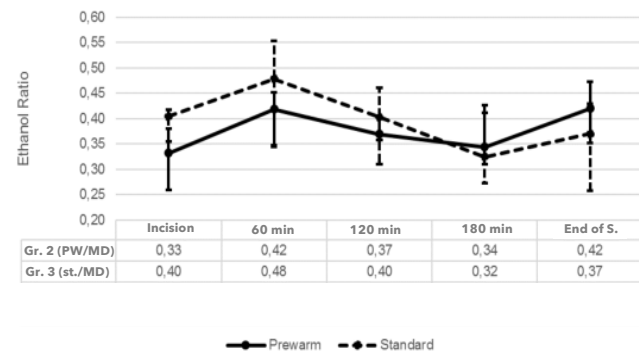


Fig.3: Ethanol Ratio in subcutaneous microdialysis (median/quartil: 25%; 75%)

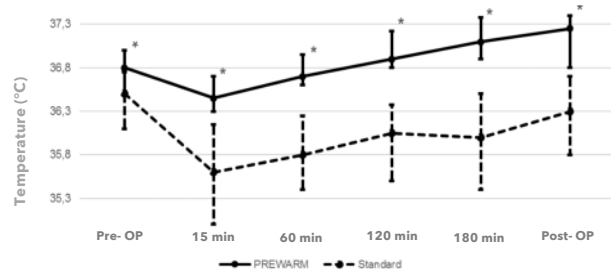


Fig.4: Body Core Temperature, * p< 0.001, (median/quartil: 25%; 75%)

Conclusions: No effect in StO₂ and microperfusion as function of PW is detectable. Nevertheless, MD parameters should provide further information on stabilized intraop. microperfusion in normothermic patients. PW in order to maintain normothermia in cytoreductive surgery is effective.