Response to Letter to Editor_(Roth)_A&A_Prewarming RCT

We appreciate the comments by Roth[1] regarding our study *Preoperative warming versus no preoperative warming for maintenance of normothermia in women receiving intrathecal morphine for caesarean delivery: a single-blinded, randomized controlled trial*[2] and welcome the opportunity to discuss the issues raised.

All women in our study received prophylactic phenylephrine infusion titrated to avoid hypotension, as per standard of care in our institution and as per the study protocol. However, in four cases, metaraminol was also administered, with temperature decline in these cases ranging from 0.3-1.5°C. Therefore, as we noted, due to individual differences in vasopressor use, only limited exploratory analysis of the secondary outcome of mean arterial pressure was conducted. While there is some limited evidence to suggest that patients receiving phenylephrine may experience higher end of procedure temperatures, [3] during orthopaedic surgery under general anaesthesia, more recent evidence from an observational study found that larger doses of phenylephrine results in lower (although not hypothermic) maternal temperatures.[4] In our study – in which all women received phenylephrine infusion – redistribution hypothermia remained clinically significant across both groups. With this conflicting evidence in mind, acknowledging that the physiology is complex and that there is no gold standard measure of vasodilation, it would be valuable for future studies amongst women receiving neuraxial anesthesia to accurately measure the use and dose of vasopressors – as well as oxytocics, which may also influence maternal perception of heat due to flushing.

In response to the comments regarding the measurement of shivering in our study, we confirm that this was not assessed as a *surrogate* outcome for hypothermia. Although we did comment that the intensity and incidence of shivering may indicate the severity of hypothermia, our study also acknowledges that the aetiology of shivering may be multifactorial. We did not measure skin temperature in our study, however note that thermal comfort did not influence shivering.

References

1. Roth, J.V Hypothermia during Cesarean delivery. (2018) *Anesth Analg.* XXXXX

2. Munday, J., Osborne, S., Yates, P., Sturgess, D., Jones, L., Gosden, E. (2018) Preoperative Warming versus no Preoperative Warming for Maintenance of Normothermia in Women Receiving Intrathecal Morphine for Cesarean Delivery: a Single-Blinded, Randomized, Controlled Trioal. *Anesth Analg 126*(1): 183-189

3. Ro, Y, Huh, J., Min, S., Han, S., Hwang, J., Yang., S….Kim, C. (2009). Phenyleprhine attenuates intra-operative hypothermia during spinal anaesthesia*. Journal of International Medical Research, 37*(6), 1701-1708

4. Hilton, E. J., Wilson, S. H., Wolf, B. J., Hand, W., Roberts, L., & Hebbar, L. (2015). Effect of Intraoperative Phenylephrine Infusion on Redistribution Hypothermia During Cesarean Delivery Under Spinal Anesthesia. *J Clin Anesth Manag*, 1(1).