Abstract # 156

Spinal Ultrasound to Facilitate Neuraxial Anesthesia in Obese Parturients: A Comparison Between the Transverse and Longitudinal Plane

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Paul Sahota, M.D.; Jose CA Carvalho, M.D., Ph.D.; Mrinalini Balki, M.D.; Cristian Arzola, M.D., M.Sc.
Mount Sinai Hospital

Introduction: Spinal ultrasound (US) in the transverse median plane (TM) may underestimate the distance to the epidural space in obese pregnant women, most likely due to compression of the subcutaneous (SC) tissue(1). The superior image quality in the longitudinal paramedian plane (LP) may allow better imaging with less compression, and therefore increase accuracy. This study was conducted to test this hypothesis.

Methods: With REB approval and informed consent, we recruited obese pregnant women undergoing epidural/CSE analgesia. Ultrasound imaging was performed with a 5-2 MHz curved probe to identify the insertion point and the distance from the skin to the epidural space (UD) in the LP and TM planes. The UD was measured with the least possible compression of the SC tissue. An anesthetist blinded to the UD performed the epidural/CSE at the pre-determined insertion point, and marked the distance from the skin to the epidural space (ND). The agreement between UD and ND in both TM and LP planes was calculated using the Concordance Correlation Coefficient (CCC). Bland-Altman analysis was used to determine the 95% limits of agreement (LOA) between UD and ND.

Results: We studied 45 women: 19 class I, 12 class II, 14 class III. The UD-LP was 6.4±1.2cm, UD-TM 6.4±1.1cm, and ND 6.5±1.4cm (mean±sd). The quality of imaging was good in the LP and in the TM plane in 88.6% and 72.7% of women respectively. The success of the insertion point was 95.6% with a median number of 1 re-direction (p25-p75=0-3). The CCC between UD-LP and ND was 0.877 (95% CI: 0.811-0.943), and that between UD-TM and ND was 0.891 (95% CI: 0.834-0.948), with 95% LOA of -1.364 to 1.092cm and -1.248 to 1.023cm respectively (Figure). The CCC between UD-LP and UD-TM was 0.965 (95% CI: 0.945-0.985) with a 95% LOA of -0.630 to 0.583cm.

Discussion: In obese women, the quality of spinal US imaging in the LP plane is superior to that in the TM plane. The UD in the LP and TM planes show strong correlation and can be used interchangeably, which is useful when the image quality in the TM plane is poor. The optimization of the spinal US technique with less compression of the SC tissue in excellent correlation between UD and ND in both planes. However, the LOA of this correlation are as wide as in a previous study in which the optimization was not used (1). Caution should be exercised when using UD as a guide for ND, and an error of up to 1.4 cm should be expected.
