Abstract #: 123

Combined spinal and epidural analgesia (CSEA) for labor: effects on uteroplacental blood flow and maternal catecholamines

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**Introduction:** CSEA has been associated with an earlier and higher incidence of fetal heart rate (FHR) changes. A fall in plasma epinephrine has been observed but other mechanisms and potential effects on fetal well-being are not defined. Purpose of this study was to assess the effect of CSEA on umbilical and uterine blood flow and maternal catecholamines

**Methods:** After IRB approval and informed consent, healthy parturient women with singleton, uncomplicated pregnancies at term received CSEA with bupivacaine and fentanyl. Pain (VAS), maternal blood pressure, fetal and maternal heart rate, blood flow velocity waveforms and pulsatility indices (PI) of the uterine and fetal umbilical arteries were measured before and at 5, 10, 15 and 30 minutes following CSEA. Intervention criteria included IV TNT for uterine relaxation, IV ephedrine and volume loading to correct hypotension. Any other intervention excluded patient from study. FHR tracings were reviewed post hoc. Blood samples to measure plasma epinephrine, normetanephrine and serotonin by HPLC were drawn at baseline 10 and 30 minutes. Statistical analyses included repeated measures of analysis of variance (Friedman) and Bonferroni and Tukey post tests with p < 0.05 defined as significant.

**Results:** 60 patients were studied. VAS pain scores decreased significantly from 5 minutes. Systolic, diastolic and mean arterial blood pressures decreased significantly at 10 minutes and maternal heart rate from 10 to 30 minutes following CSEA. FHR did not change significantly and tracings did not show altered patterns. After CSEA the uterine artery mean PI increased at 10 minutes (p<0.05) while no changes occurred in umbilical artery mean PI when compared to baseline. Apgar scores were within normal range in all newborns. Adrenalin and serotonin plasma levels decreased from 10 min onwards, and adrenalin / normetanephrine ratio decreased significantly after CSEA.

**Discussion:** Maternal hemodynamics and FHR recording after CSEA may not reveal stable uteroplacental perfusion. The increase in uterine artery PI indicates increase in uterine vascular resistance without derangement in fetal perfusion, as umbilical artery PI remained stable. Decrease in epinephrine after pain relief and imbalance in maternal catecholamines favoring noradrenaline vasoconstriction may explain these observations. Additional studies may contribute to define their clinical impact and cautious use of CSEA is suggested when compromised uteroplacental perfusion and fetal well being state are suspected.