Clinical Study of the Effects of Two Fluid Regimens, Restricted and Standard, on Fetus and Mother During Cesarean Section Under Spinal Anesthesia

Abstract Type: Original Research
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Introduction: We hypothesized that restricting IV fluid therapy during cesarean sections (CS) will not have a negative impact on neonates and will improve the maternal clinical outcomes. Currently, an average of 20 to 48 ml/kg of Lactated Ringer's solution (LR) is administered for uncomplicated CS at our institution (1). Clinical studies have shown that intraoperative fluid restriction, rather than the current "standard" fluid regimen, improves clinical outcome after intra-abdominal surgery (2-4). As part of an ongoing prospective study of fluid management and clinical outcomes during CS under spinal anesthesia, we are evaluating the impact of different volumes of intraoperative fluid therapy on the maternal hemodynamics, surgical blood loss, and on the physiological condition of newborns.

Methods: Patients scheduled for CS are randomly assigned to one of two groups, a restricted volume of LR (RV: n=65) and a standard volume of LR (SV: n=55) group; receiving a total of either 10 ml/kg in RV or 40 ml/kg in SV during the procedure. LR is administered at a constant rate to patients over a period of 70 minutes (average) with 1/3 administered during induction of spinal anesthesia, 1/3 during section delivery, and 1/3 during closure of the abdomen. Successful fluid therapy is achieved when a patient has received 100 ± 10% of the targeted volume for her treatment group. APGAR, umbilical arterial and venous blood gases from neonates were obtained. Mothers' MBP, HR, EBL, pre and post-op RBC, Hb, Hct, WBC, Plt were collected and analyzed statistically. IRB approval and patient consent were received before the study.

Results: There was no change of neonatal APGAR, A/V blood gas analysis, or maternal hemodynamics, and doses of vasopressors used between the two groups. Post-operative RBC, Hb, and Hct were higher in the RV group, and WBC count was lower in this group. (Figure 1-10).

Discussion and Conclusion: In the study, we have investigated whether restricted fluid infusion during CS has an impact on both neonatal conditions and maternal hemodynamics and hematological profiles. Our result has suggested that 1) The neonatal APGAR scores and blood gas analysis from both groups are almost identical, which suggests that restricted fluid therapy has no detrimental effects on fetal perfusion and general physiologic status; 2) LR infusion is not effective in treating or preventing spinal hypotension; 3) Restricted fluid decreases surgical blood loss (0.5g/dl); 4) It appears that more LR infusion increases WBC count but its clinical significance yet to be elucidated.