Abstract # 36

The Quest for a Novel Predictor of Uterine Atony and Hemodynamic Instability in Cesarean Delivery: Serum Uric Acid

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Vesela Kovacheva, M.D., Ph.D.; Mieke Soens, M.D.; Aya Mitani, M.P.H.; Lawrence Tsen, M.D.
Brigham and Women's Hospital

Introduction: Oxidative stress is likely an important factor in the etiology and pathophysiology of preeclampsia. Reactive oxygen species (ROS) are a byproduct of the purine metabolism in which xanthine oxidase produces uric acid (UA). In addition, it has been shown that ROS decrease the myometrial contractility. Outside of pregnancy, hyperuricemia correlates with increased vascular tone and depressed myocardial contractility. We hypothesized that UA, a marker of cardiac energetics, is also a marker of uterine energetics and therefore involved in the pathogenesis of cardiovascular instability and uterine atony. Subsequently, we investigated whether UA can predict uterine atony and postsypinal hemodynamic instability during cesarean delivery.

Methods: In all patients undergoing cesarean delivery in 2009 (N=2526), UA was tested in 508 cases. Data regarding pre- and post-operative hematocrit and the use of uterotonics and vasopressors were collected. The records of 358 patients with singleton gestations were complete. Outcome measures, as well as maternal age, body mass index, comorbidities, serum creatinine, labor augmentation, gestational age, fetal weight and magnesium therapy were analyzed using univariate and multivariate linear regression.

Results: The patient population had a mean UA of 5.4±1.4 mg/dL and hematocrit difference of 5.2±3.2 mg/dL. UA was not affected by age, body mass index or presence of diabetes. A small but significant correlation between UA and serum creatinine (r² =0.3, P=9E-30), gestational age (r² =0.08, P=3E-08) and fetal weight (r² =0.06, P=2.9E-06) was found. However, multivariate regression analysis failed to show an association between hematocrit difference, uterotonics and vasopressor use and UA. Subgroup analyses of patients with hypertensive disorders of pregnancy, high (> 6.5 mg/dL) UA and healthy patients also showed no significance. Compared to non-preeclamptic patients, less vasopressor use was observed in preeclamptic patients (P=0.03).

Conclusion: Despite UA being a marker of oxidative stress and ROS decreasing myometrial contractility, our study shows that UA is not a predictor of uterine atony and hemodynamic instability during cesarean delivery. Patients with preeclampsia do appear to require less postspinal vasopressors as shown by other investigators (1). These findings may underscore the observation that UA variability is multifactorial and influenced by both environmental and genetic factors. Depending on the microenvironment, UA can have both pro- and anti-oxidant properties. Although readily available, UA is not a clinically significant marker of hematocrit difference, need for uterotonics or post-spinal vasopressors.

References: