SOAP ABSTRACTS

A5

A Neonatal Outcome With Ephedrine Infusions With or Without Preloading During Spinal Anesthesia For Cesarean Section

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Both fluid preloading (FP) and ephedrine infusions are used to prevent hypotension during spinal anesthesia for cesarean section (CS). This study was designed to compare the neonatal effects of varying ephedrine infusions with/without preloading.

Following IRB approved consent, healthy women with uncomplicated term pregnancies for elective cesarean section under spinal anesthesia were randomized to seven groups. In a double-blinded fashion, group A (n=24) received Ringer's lactate 1000 ml (FP) over 20 min before spinal injection; groups B (n=25), C (n=25), and D (n=28) received FP plus ephedrine at 1mg/min, 2mg/min and 3-4mg/min, respectively, from spinal injection upto delivery; groups E (n=24), F(n=24), and G (n=35) received ephedrine only at 1mg/min, 2mg/min and 3-4mg/min, respectively, from spinal injection upto delivery. Spinal anesthesia was with hyperbaric 0.75% bupivacaine 1.5 ml and fentanyl 20 mcg. Heart rate and blood pressure were monitored every minute. Hypotension, a decrease in systolic pressure (SBP) by > 30% of the baseline, was corrected with 5 mg ephedrine boluses. Data were analyzed using Student's t-test and chi-square test.

Demographics were similar in both groups. Hypotension was not significantly different between the 7 groups (50%, 40%, 40%, 21%, 50%, 50%, 31%, respectively). However, more patients in groups E, F, and G required over 3 additional ephedrine boluses (25%, 29%, 14%, respectively) versus only 6% in group A ($P = 0.003$), signifying more severe and prolonged hypotension. And in groups D and G, umbilical arterial pH (7.11 ± 0.11 and 7.13 ± 0.12, respectively) was significantly lower than group A (7.26 ± 0.10, $p < 0.01$); and base deficit (-7.5 ± 5.5 and -6.7 ± 4.6, respectively) was significantly lower than group A (-0.9 ± 3.5, $p < 0.01$). In groups D and G ephedrine was stopped in 70% of subjects due to unacceptable hypertension and tachycardia (SBP > 150 mmHg and HR > 130/min).

Ephedrine infusions without preloading during spinal anesthesia for cesarean section may cause severe and prolonged hypotension. Although higher doses of ephedrine infusions with or without preloading may reduce the incidence of hypotension it is at the expense of fetal acidemia and maternal hypertension and tachycardia. There appears to be no benefit of ephedrine infusions over preloading during spinal anesthesia for CS.

A6

Association of the Arg16Gly Polymorphism of the β_2 Adrenergic Receptor with Preterm Labor

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Introduction Prematurity, defined as birth before 37 weeks of gestation, has been shown to occur in about 10% of all singleton live births and is a major problem in obstetric practice and a significant public health issue. The mechanisms involved in preterm labor (PTL) are still unclear, and no biochemical markers are predictive of preterm birth. Stimulation of the beta-2 adrenergic receptor (β_2AR) results in uterine relaxation. It is possible that alteration in the function of the β_2AR could contribute to the onset of PTL. There are several genetic variants of the human β_2AR (1). At position 16, substitution of glycine (gly) for arginine (arg) results in increased down-regulation of the receptor, while substitution of glutamate (glu) for glutamine (gln) at position 27 leads to decreased down-regulation. Our hypothesis is that PTL may be preferentially associated with a particular genotype of the β_2AR.

Methods With IRB approval and informed consent, we gathered blood samples from 23 Hispanic parturients delivering with PTL and 185 Hispanic controls who delivered at term (TL). PTL was defined as spontaneous onset of labor resulting in delivery before 37 weeks of gestation, in a singleton pregnancy, with no chorioamnionitis, uterine malformation, abnormal placental implantation, fetal abnormality, nor drug abuse. Genomic DNA was isolated from peripheral blood and the alleles of the β_2AR were identified by established techniques (2). Data were analyzed using χ^2 tests as appropriate ($p < 0.05$).

Results No woman presenting with PTL and delivery was homozygous for arginine at position 16 (p=0.007). Using the gene counting method (2), PTL was associated with the presence of glycine at position 16 (p=0.011). There was no correlation of PTL with the Gln27Glu polymorphism.

Table: β_2AR Genotypes

	Arg16arg	Arg16gly	Gly16gly	Gln27gln	Gln27glu	Glu27glu
PTL(n=23)	0	61%	39%	52%	35%	13%
TL (n=185)	31%	41%	28%	70%	9%	21%

Discussion It is intriguing to note that the Arg16arg genotype which results in decreased down-regulation of the β_2AR is associated with protection from PTL. Since we used delivery as a clear endpoint, we are unable to determine whether PTL does not occur with the Arg16arg or whether treatment with ß-agonists is more effective. This association, if confirmed in a larger sample, could have significant implications regarding the pathogenesis and/or treatment of PTL.

Refs: 1. J Allergy Clin Immunol 1999; 104:S42-6; 2. Pharmacogenetics 1999; 6:511-516

ORAL PRESENTATIONS

A7

Is Fluid Preloading Necessary Before Low Dose Epidural Analgesia In Labor?

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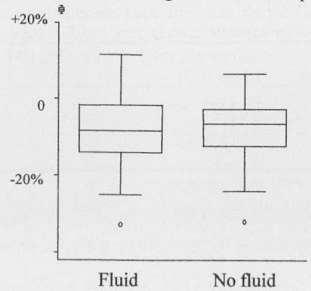
Introduction: Preloading with fluid is routinely recommended before regional block in labor. Low dose epidurals produce better hemodynamic stability[1]. Our aim was to compare the degree and incidence of hypotension (defined as a fall of >20% mean arterial pressure (MAP) from baseline), in groups with and without an i.v. crystalloid preload. Fetal heart rate abnormalities were also compared in these groups.

Methods: 168 women requesting epidural analgesia were randomized into two groups: 1) no i.v. crystalloid preload but i.v. access established; 2) 7 ml/kg i.v. Hartmann's solution before epidural injection (0.1% bupivacaine & 2 µg/ml fentanyl). Mean arterial blood pressure was recorded every 5 minutes for 30 minutes. Fetal heart rate (CTG) was also recorded during the same time.

Results: There was no difference in the mean change in MAP (see fig). Similar proportions of women showed falls of 20% or greater (13.4% vs 10.8%). Differences were neither clinically or statistically significant (χ^2: $P>0.1$). Blinded analysis by independent obstetricians revealed no differences in CTG abnormalities.

Figure: Maximum change in mean blood pressure from time 0



Conclusion: Pre-loading with low dose epidurals has little effect on the incidence of maternal hypotension or fetal heart rate abnormalities.

Reference:

1. Int J Obstet Anesth 1998; 7: 197. (Free paper)

A8

Atrial Natriuretic Peptide (ANP) and Hydration prior to Spinal Anesthesia (SA) for Cesarean Section (CS)

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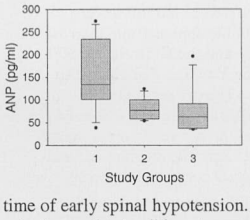
SA poses a significant risk for maternal hypotension. The effectiveness of an intravenous (iv) fluid bolus prior to SA to prevent hypotension has been questioned (1). It has been suggested that the release of ANP is the reason prehydration fails to prevent hypotension (2). This study determines if ANP is released *immediately* after a fluid bolus and whether patients who do not receive a fluid bolus are at higher risk for hypotension.

Twenty-one healthy women scheduled for an elective CS were randomly assigned to receive either 15 ml/kg lactated Ringer's solution (LR) as a bolus dose within 20 min prior to SA (group 1, n = 7), 15 ml/kg LR over 20 min starting at the time of spinal anesthetic (group 2, n = 7), or no prehydration at all (group 3, n = 7). Serial blood pressure measurements were obtained at rest and throughout the surgical procedure. ANP was measured at the time of the iv placement and 15 minutes after spinal anesthetic injection.

Figure 1: Atrial Natriuretic Peptide



ANP values were significantly greater in group 1 (p=0.037 one-way ANOVA) when compared to group 2 and 3. No group differed in the degree of hypotension or ephedrine requirements (one-way ANOVA, power=0.252).

This study demonstrates that ANP is significantly elevated at the time of early spinal hypotension. Mothers receiving no iv fluid bolus prior to spinal anesthesia did not appear to be at greater risk for hypotension. Because of the small sample size (and therefore low statistical power), the latter observation has to be interpreted with caution.

References: (1) Br J Anaesth 1995; 75:262; (2) Anaesthesia 1996; 134:149