This prospective observational study used a convenience sample of 117 healthy women with singleton pregnancies at >37 weeks gestation scheduled to undergo elective cesarean delivery with planned spinal anesthesia between September 27, 2005 and March 5, 2007. Of these, 96 women completed the protocol and had data available for analysis. The primary outcome measure was total phenylephrine dose administered in 15 minutes, a surrogate measure for severity of hypotension. An automated oscillometric blood pressure cuff was used to record blood pressure 3 times at least 3 minutes apart in the preoperative holding area; the mean of these 3 values was taken as the baseline systolic blood pressure and diastolic blood pressure.

A phenylephrine infusion was started at 50 µg/min at the time of spinal injection, and phenylephrine infusion totals at 5, 10, and 15 minutes were used for the analysis. Perioperative blood samples were taken from all subjects for DNA isolation and genotyping of ADRB2 at codons 16 and 27. Multiple linear regression and analysis of variance were used to determine the effect of genotype on administered phenylephrine.

There was no difference in phenylephrine administered according to genotype at codon 16 or 27 in the unadjusted analysis. After adjustment for covariates, the analysis found that Arg16 homozygotes received 200 µg more phenylephrine at 15 minutes than the reference group (Gly16 homozygotes). In addition, baseline systolic blood pressure appeared to have an effect on phenylephrine administration, as higher baseline pressure resulted in more phenylephrine being administered after adjusting for covariates in the full regression model. However, the genotype at codon 27 had no effect on phenylephrine administration. Combined with the previous results regarding ephedrine and ADRB2 genotype, the current results indicate that the effect of ADRB2 on ephedrine dose may be at least partially explained by a differential response to ephedrine based on ADRB2 genotype, because phenylephrine dose appeared to be less affected than ephedrine dose. These results also suggest the possibility of ADRB2-mediated differences in the physiologic response to spinal anesthesia.

The Importance of the Monitoring of Resuscitation With Blood Transfusion for Uterine Inversion in Obstetrical Hemorrhage

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Uterine inversion is responsible for 3.3% of postpartum hemorrhages, which is the cause of half of the maternal deaths in Japan. Diagnostic signs of uterine inversion include severe bleeding, absence of the uterine fundus, or presence of a vaginal mass. Early recognition is critical to prevent maternal mortality. This review compared the critical care in 6 cases of uterine inversion, including the patient’s condition on admission, time to diagnosis, treatment, and resuscitation technique.

This study was a retrospective review of pregnant women with uterine inversion at 4 Japanese secondary and tertiary perinatal centers from January 2007 to December 2013. For the 6 cases found, the authors reviewed the patients’ medical records for maternal characteristics and delivery information. All 6 women were experiencing their first pregnancy, had an average age of 28, and had a shock index of at least 1.6 on admission (range 1.6-2.7). Two of the cases involved manual removal of the placenta, and the uterine inversion was noticed immediately. These 2 patients displayed abdominal pain, but no signs of shock. In the other 4 cases, there was a delay in the diagnosis. Five of the patients delivered in a private clinic and the time for them to be transferred to a perinatal center was >50 minutes (range 50-100 min). One of these clinics was in a rural area, which caused the delay in transfer. On admission, 5 patients were given an immediate transfusion and all received manual uterine replacement. Five of the patients were not given enough fluid replacement and 1 patient had a 30-minute delay from admission to transfusion. The average blood loss was 4578 ± 2143 mL. Four patients were admitted to the intensive care unit and 1 died due to the delays in diagnosis, transfer, and transfusion as well as inadequate fluid resuscitation.

A main cause of morbidity and mortality for uterine inversion is delayed diagnosis, which delayed all other aspects of treatment. Neurogenic/hypovolemic shock is known to be an early sign of this condition, though none of the patients in this study exhibited signs of it. As uterine inversion is very rare, private clinics may not have the resources or experience required to diagnose and treat it. Disease-specific guidelines are therefore needed for this and other rare obstetric occurrences. When there is a delay in diagnosing uterine inversion, an early and onsite blood transfusion using O-group blood could be the difference between life and death, as was shown in this study. Larger studies will be needed to confirm this finding.