Genetic Predictors of Maternal Hypotension during Spinal Anesthesia Sought. Smiley et al. (page 664)

Smiley et al. recruited 170 healthy women undergoing elective cesarean section to determine whether genetic variants of the β₂ adrenoceptor (β₂AR) alter either the incidence of hypotension or amount of vasopressor treatment required during spinal anesthesia. The rationale for this study was based on other studies, including one by the current authors, linking pressor response to laryngoscopy and tracheal intubation with β₂AR polymorphism. Women with hypertension, preeclampsia, or cardiovascular disease were excluded from the study. Spinal anesthesia was performed with 12 mg hyperbaric bupivacaine, 25 μg fentanyl, and 200 μg morphine. During the study period, the Trendelenburg position, reverse Trendelenburg, and changes in lateral tilt were avoided. If hypotension developed, women with heart rates less than 120 were treated with 5–15 mg ephedrine; those with heart rates greater than 120 were treated with 40–80 μg intravenous phenylephrine. A research coordinator recorded blood pressure, heart rate, and any medications given each minute until delivery.

Blood samples for obtaining DNA analysis were obtained perioperatively from each study participant. The β₂AR genotype at codons 16 and 27 was determined for each woman, and analysis of variance was used to compare variables between genotypes. The researchers used ephedrine or phenylephrine in more than 90% of the patients. No difference of incidence of hypotension was linked to β₂AR genotypes. However, they did find a significant effect of genotype on the amount of vasopressor treatment required. For example, women who were Gly homozygotes received significantly less ephedrine than those who were Arg16 homozygotes or Arg16/Gly heterozygotes. The authors found that glycine at position 16 and/or glutamate at position 27 of the β₂AR lead to lower vasopressor use for treatment of maternal hypotension during spinal anesthesia. They urge further studies in larger samples across all ethnic groups (this study included white, Hispanic, and African-American participants) with more accurately titrated doses of vasopressors.
cord compression. Tokunaga et al. tested methods for keeping the rheumatoid arthritis patient’s head and neck protruded, so as to reduce risk of excessive flexion of the cervical spine during orotracheal intubation. The team enrolled 10 patients scheduled for general anesthesia for orthopedic procedures.

Conventional lateral cervical x-rays were obtained the day before surgery with the patient’s head in three positions—flexion, neutral, and extension—while the patient was sitting or standing. During induction of anesthesia, a lateral radiographic view of the upper cervical spine was obtained in two positions—during airway control with a face mask and during orotracheal intubation at the actual point of maximum laryngeal exposure with a conventional laryngoscope. Intubations were performed with the patient’s head positioned on a flat pillow or on a flat pillow combined with a donut-shaped pillow. The position that showed less atlantoaxial subluxation was chosen for the head position during surgery. Copies of the fluoroscopic images were used to determine anterior atlantodental intervals, posterior atlantodental interval, and angle of atlas and axis (C1–C2 angle; angle between a line parallel to the distal line of C1 and C2).

Based on the authors’ calculations, the anterior atlantodental interval average was 5.1 mm in the flat pillow position, and 2.3 mm in the protrusion position (which employed both flat and donut pillows). While it reduced the anterior atlantodental interval, the protrusion position increased the posterior atlantodental interval in all 10 rheumatoid arthritis patients with atlantoaxial subluxation. The results suggest that the protrusion position, which involves support of the upper cervical spine and extension at the craniocervical junction, might be advantageous for these patients.

**Authors Assess Risks of Xenon Used as a Neuroprotective Agent during Cardiopulmonary Bypass. Jungwirth et al. (page 770)**

Although xenon’s neuroprotective properties may improve cerebral outcome after cardiac surgery using cardiopulmonary bypass (CPB), the tendency to expand gaseous bubbles may abolish this effect or even worsen cerebral outcome. Jungwirth et al. studied the impact of xenon on neurologic, cognitive, and histologic outcome after CPB with cerebral air emboli (CAE) in rats. Groups of 10 rats each were assigned to one of four groups. In two groups receiving both CPB and CAE, rats were subjected to 90-min normothermic CPB with 10 repetitively administered CAE. Rats in two sham groups were not exposed to CPB and CAE. Each group was further subdivided into those receiving xenon (56%; 20 min before, during, and 30 min after CPB) and nitrogen groups. The rats’ performance on neurologic and cognitive function tests was assessed until 14 days after surgery. After killing the rats, investigators determined the extent of cerebral infarcts due to the CAE.

Animals in the CPB–CAE groups showed transient deficits in gross neurologic functions. Fine motor and cognitive impairments persisted until postoperative day 14 in rats from the CPB–CAE–xenon group. Infarct volumes were consistently larger in this group compared to the CPB–CAE–nitrogen group. It appears that xenon exposure aggravated the neurologic dysfunction produced by CAE during CPB. The potential neuroprotective effects of xenon may have been masked by the effects of xenon on CAE.

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