

Reports of Scientific Meetings

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Society for Obstetric Anesthesia and Perinatology

The ninth annual meeting of the Society for Obstetric Anesthesia and Perinatology was held April 14 to 17, 1977 in Seattle, Washington. Major areas of discussion included recent developments in obstetric anesthesia, neonatology, and obstetrics. Forty-six "works in progress" were presented. The following papers are representative of active research effort in the field.

Pue, Plumer, Resnik, and Brink (University of California Medical Center, San Diego) examined the effects of local anesthetics on uterine blood flow in pregnant sheep. Dose-response curves for bupivacaine, mepivacaine, lidocaine, and chlorprocaine were constructed following direct infusion of local anesthetics into the uterine artery. Infusion rates were calculated to yield initial uterine arterial blood concentrations of 1, 5, 10, 25, and 50 $\mu\text{g/ml}$. Each of the local anesthetics caused a dose-related decrease in uterine blood flow independent of changes in maternal mean arterial or intrauterine pressures. The authors attributed the decrease in uterine blood flow to an increase in uterine vascular resistance. They further postulated that post-paracervical block fetal bradycardia may be related to uterine-artery vasoconstriction. Using a similar preparation, Fishburne, Hopkinson, and Greiss (Bowman Gray School of Medicine and Birmingham, England) reported comparable reductions in uterine flow after maternal intra-arterial administration of 2-chloroprocaine, lidocaine, and bupivacaine. Fishburne and co-workers, however, found an *increase* in intrauterine pressure.

Gutsche, Morishima, Keenaghan and Covino (Columbia University and Astra Pharmaceutical Products, Framingham, Massachusetts) examined changes in maternal and fetal hemodynamics and acid-base status in the pregnant ewe following intravenous administration of convulsive doses of lidocaine. Mean lidocaine concentrations in maternal and fetal arterial blood during convulsions were 6.41 $\mu\text{g/ml}$ and 2.52 $\mu\text{g/ml}$, respectively. A 35 per cent reduction in uterine blood flow occurred at the onset of convulsions. Fetal bradycardia followed, accompanied by a reduction in fetal Pa_{O_2} from 23 to 19 torr. The authors concluded that local anesthetic-induced maternal convulsions may produce fetal distress secondary to a reduction of maternal uterine blood flow.

Kennedy, Erenberg, Robillard, Merkow, and Turner (University of Iowa) examined fetal uptake of bupivacaine during alterations in maternal and fetal blood pH. Awake, tracheostomized pregnant ewes were hyperventilated with room air to a pH of 7.70, while 0.25 M lactic acid was infused into a fetal vein to achieve a fetal pH of 7.20. Bupivacaine, 1.5 mg/kg maternal weight, was then infused over one minute into the maternal jugular vein. The fetal-to-maternal bupivacaine concentration ratios were increased approximately 50 per cent by the combined maternal respiratory alkalosis and fetal acidosis.

Maternal and neonatal acid-base status and bupivacaine concentrations were examined by Datta, Ostheimer, Brown, Weiss, and Alper (Boston Hospital for Women and Harvard Medical School) in 20 parturients after epidural anesthesia with 0.75 per cent bupivacaine for cesarean section. Ten mothers were studied in the supine position after onset of the blockade, while ten were placed in the left lateral position following onset of the block. Left uterine displacement was achieved by placing a roll under the right hip. Neonates born of mothers maintained in the lateral position had a significantly higher umbilical artery blood pH (7.30), lower umbilical vein-to-maternal vein bupivacaine concentration ratio (0.31), and smaller umbilical vein-to-umbilical artery concentration difference (UV-UA ratio 0.02) than did neonates whose mothers were positioned supine (umbilical artery pH 7.20, UV/MV ratio 0.44, and UV-UA ratio 0.07). Postulated mechanisms for the wider umbilical vein-to-umbilical artery concentration differences in the acidotic neonates include intracellular trapping of ionized local anesthetic, increased binding of local anesthetic by tissue proteins, altered fetal blood flow during acidosis, or increased fetal excretion of bupivacaine at lower fetal pH.

The neonatal effects of bupivacaine following epidural anesthesia were examined by McGuinness, Merkow, Erenberg, and Kennedy (University of Iowa). Parturients undergoing elective cesarean section were randomly divided into a group receiving lumbar epidural anesthesia with 165 mg bupivacaine without epinephrine and a control group receiving subarachnoid block using 10 mg tetracaine. Every parturient received approximately one liter of lactated Ringer's solution and 100 per cent oxygen as the inspired gas prior to delivery. The authors measured cord blood bupivacaine and blood gases, and evaluated neonatal Apgar scores and neurobehavioral performance. Neonatal neurobehavioral assessment in the bupivacaine group was comparable to that seen in the control group.

Hodgkinson, Grewall, Bhatt, and Marx (University of Texas, San Antonio, and Albert Einstein College of Medicine) examined neonatal neurobehavioral performance after maternal administration of meperidine with and without narcotic reversal with naloxone. One hundred parturients who had received 75 mg or more of meperidine within 4 hours of delivery were randomly divided into two equal treatment groups. One meperidine group received naloxone, 0.4 mg, intravenously 15 or more minutes before delivery; a second group received only meperidine. A control group of 50 parturients received neither meperidine nor naloxone. Neonatal neurobehavioral tests were performed on all neonates at 2, 4, and 36 hours of age. Neonates delivered from mothers receiving meperidine alone showed depression of pinprick response, tone, rooting, sucking, Moro response, and alertness at all examination intervals. Neonates whose

mothers received meperidine and naloxone showed no statistically significant difference from the no-meperidine group of infants at 2 hours of age, but had low scores at 4 and 24 to 36 hours of age, similar to the scores of babies whose mothers received meperidine alone.

Palahniuk (University of Manitoba, Winnipeg, Canada) examined the effectiveness of a prophylactic blood patch following inadvertent dural puncture. In 11 of 86 parturients who had "wet taps," 10 ml of homologous blood were injected through the epidural catheter at the completion of the delivery in an attempt to prevent development of headache. In 75 patients without prophylactic blood patch 31, or 40 per cent, did not develop headache, while 5, or 46 per cent, of the 11 receiving prophylactic blood patch failed to develop headache. Prophylactic blood patch (utilizing the epidural catheter) did not appear effective in preventing post-lumbar-puncture headache following "wet tap."

Morishima, Yeh, Stark, Milliez, Gutsche, Indyk, and James (Columbia University) examined the effect of maternal stress on fetal cardiovascular and acid-base function in pregnant baboons or rhesus monkeys. Bright light or noise was used as psychological stress in four animals that were breathing room air (Group I), while clamping the skin of the toes was used in seven animals (Group II) breathing nitrous oxide-oxygen or room air. In Group I, maternal mean arterial blood pressure and heart rate increased in response to stress, accompanied by fetal bradycardia, acidosis, and hypoxemia. Toe clamping in mothers receiving only room air led to reduction in fetal blood pH, oxygen saturation, and heart rate. Depression of fetal cardiovascular function, oxygenation, and pH was more profound in fetuses with pre-existing acidosis. Treatment of maternal agitation with pentobarbital or nitrous oxide, or elimination of the stressful stimulus, restored fetal heart rate and acid-base status to the control level. The authors postulate that endogenous maternal catecholamines may cause fetal deterioration during maternal stress.

Reynolds, Wynne, and Hood (University of Florida) examined the pathologic and radiologic findings after pulmonary aspiration of weakly acidic gastric contents (pH 4.3) containing small food particles. Gastric contents of partially digested food obtained from a human volunteer were injected into the tracheas of 21 anesthetized rabbits, utilizing a dose of 0.5 ml/kg. A second group of 21 rabbits received a similar dose of saline solution. The lungs of

animals that aspirated food particles showed patchy or confluent consolidation, particularly in the left lower lobe. Histologic examination revealed alveolar spaces and small airways filled with edema fluid and/or inflammatory exudate composed of polymorphonuclear cells and macrophages. The inflammatory process was most severe surrounding identifiable food particles and was evident three to seven days after aspiration. No significant evidence for bacterial superinfection was found. The authors concluded that pulmonary aspiration of gastric contents containing small food particles will produce severe persistent pulmonary injury even when the pH of the aspirate is above the critical level of 2.5.

The importance of aspiration in anesthetic-related maternal mortality was also highlighted by Bond and Ragan (Indiana University). Maternal mortality in Indiana was retrospectively examined over the period 1967 through 1974, in which 14 deaths were thought related directly to anesthetic mishaps. Ten of the patients died of pulmonary failure secondary to aspiration of gastric fluid. One death was attributed to an overdose of lidocaine, while three were associated with the misuse of cyclopropane.

Willock (Roosevelt Hospital, New York) reported the results of a S.O.A.P. survey on attitudes toward administration of regional anesthesia in obstetrics by nurse anesthetists. Sixty-eight replies were received. Nearly half of those responding had taught regional anesthesia to nurse anesthetists, and 50 per cent indicated that they would be willing to continue to do so. Nearly three fourths of those responding felt that certified registered nurse anesthetists (CRNA's) could safely manage regional anesthesia. Most state anesthesiology societies had no official policy regarding the administration of regional anesthesia by nurse anesthetists. A few state societies were opposed to any alteration in their state laws that would allow CRNA's to administer regional anesthesia.

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