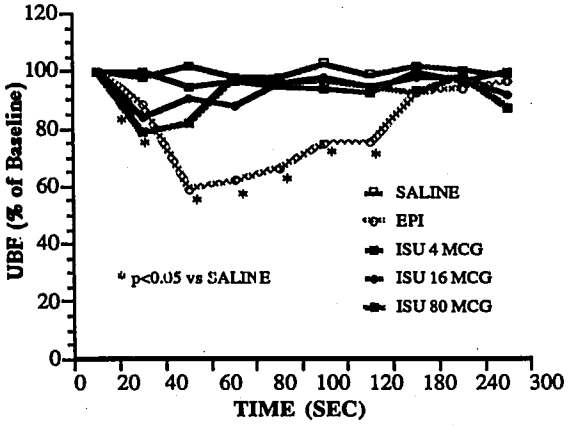
TITLE: The Maternal and Fetal Hemodynamic Effects of Isoproterenol in Gravid Ewes
AUTHORS: M.C. Norris, M.D., V.A. Arkoosh, M.D., M.R. Kirkland, M.D.
AFFILIATION: Department of Anesthesiology, Thomas Jefferson University, Philadelphia, PA 19107

INTRODUCTION: Detection of intravascular placement of epidural catheters in laboring women is an important but difficult task. While epinephrine (EPI) 15μg, produces an easily recognized tachycardia in nonpregnant patients, its effects in laboring parturients are less predictable.[1] Isoproterenol (ISO), however, does produce a consistent noticeable tachycardia in laboring women.[2] Before ISO can be further considered as a chronotropic marker in parturients its hemodynamic actions, especially its effects on uterine blood flow (UBF), need more careful study.
METHODS: Seven, near term (mean ±SD days gestation: 127.9±5.8) chronically instrumented gravid ewes with single fetuses were studied in this IACUC approved study. At least 48 hours after surgery, maternal and fetal catheters were connected to disposable transducers for continuous measurement of maternal systolic and diastolic blood pressure (MSP/MDP), maternal heart rate (MHR), pulmonary artery systolic and diastolic pressure, intrauterine pressure, fetal systolic and diastolic blood pressure and fetal heart rate. In addition, UBF was measured using an electromagnetic flow probe and cardiac output (CO) was measured by thermodilution. Following a rest period during which all measurements stabilized, the ewes received, in random sequence, intravenous injections of saline, EPI 15μg, ISO 4, 16, and 80μg. All variables returned to baseline between injections. Two factor repeated measures analysis of variance and a post hoc Dunnetts t-test were used to determine the significance of differences between the groups over time. $P<0.05$ was considered significant.
RESULTS: ISO caused a dose related increase in MHR beginning within 20 sec and, for the 16 and 80μg doses, persisting throughout the study period. CO also increased transiently after all doses of ISO but not EPI; this increase persisted following 80μg. MSP was unchanged but MDP decreased for 40 sec following 16μg and for 120 sec following ISO 80μg. Pulmonary artery pressures and fetal blood pressure and heart rate did not change. UBF decreased significantly for 120 sec following EPI 15μg and briefly after injection of ISO 16 and 80μg (Fig).



DISCUSSION: The routine use of a reliable marker of intravenous injection could prevent the serious morbidity and mortality that can result from unrecognized intravascular injection of local anesthetics. ISO reliably induces an easily detected tachycardia in laboring women.[2] Unlike EPI, ISO in clinically useful doses, does not significantly alter UBF. Our results, in addition to those previously reported from laboring women, suggest that ISO may prove clinically useful as an epidural anesthesia "test dose".
REFERENCES:
[1]Anesthesiology 66:688-691, 1987
[2]Anesthesiology 71:206-209, 1989

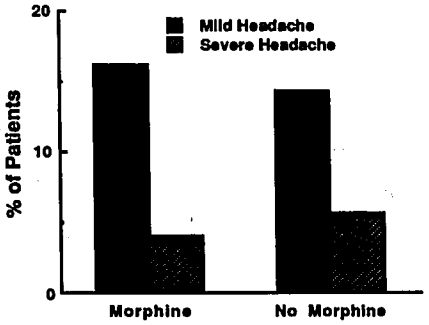
A949

TITLE: Intrathecal Morphine and Post Dural Puncture Headache
AUTHORS: M.D. Carney, M.D., J.H. Weiss, D.O., M.C. Norris, M.D., B.L. Leighton, M.D.
AFFILIATION: Department of Anesthesiology, Thomas Jefferson University, Philadelphia, PA 19107

Previous investigators have found that subarachnoid fentanyl reduces the incidence of spinal headache in obstetric patients[1]. We conducted this prospective study to evaluate the effect of intrathecal morphine on the incidence of post dural puncture headache.

All parturients undergoing cesarean section with spinal anesthesia from 12/1/89 to 3/31/90 were included in this IRB approved study. All patients were prehydrated with 1500-2000 ml Plasmalyte® before induction of spinal anesthesia. Dural puncture was performed with a 25 or 26 g needle with the bevel oriented parallel to the longitudinal axis of the back. When freely flowing CSF was obtained, 15 mg 0.75% bupivacaine with 8.25% dextrose ± 0.15 mg morphine was injected. The decision to use subarachnoid morphine was made by the resident and staff anesthesiologist independent of this study. Postoperatively, the patients were seen daily until discharge (4-5 days) by one of the investigators, and questioned about the presence of any headache they experienced. Those women complaining of a headache were asked to rate said headache as mild or severe. Two weeks after discharge, the women were contacted by telephone and again questioned about headaches.

One hundred and nine parturients were enrolled in this study. Seventy-four women received subarachnoid morphine while 35 did not. Headache occurred in 20.2% of the women while in the hospital (1 blood patch). One hundred and one women were contacted after discharge with 12.9% reporting a headache. The incidence and severity of headache differed between the groups neither in the hospital (Figure) nor 2 weeks after discharge.



In a retrospective chart review, Johnson et. al. noted that subarachnoid fentanyl decreased the incidence of spinal headache (diagnostic criteria not defined) from 6.8% to 3.6%[1]. Our prospective study found no significant effect of morphine on the incidence of any headache after dural puncture. These conflicting results may reflect differences in study design, patient population, or specific narcotic effects.

References
1. Anesthesiology 71:A911, 1989