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Title: BOLUS INJECTION OF CHLOROPROCAINE IN THE PREGNANT EWE

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**Introduction.** Chloroprocaine is an ester local anesthetic that is frequently used with regional block obstetrical anesthesia. When there is an inadvertent intravascular injection, maternal seizures and fetal distress may occur.<sup>1</sup> The extent of the compromise, its cause and relation to a specific dose of chloroprocaine remain unknown since major regional anesthesia produces changes due to both the chemical sympathectomy and the direct effects of the local anesthetic. We have previously reported the effects of bolus intravenous injection of bupivacaine in the pregnant ewe.<sup>2</sup> To date, no one has reported on the effect of bolus intravenous injections of chloroprocaine on maternal and fetal cardiovascular dynamics, catecholamines, uterine blood flow and fetal acid-base status.

**Method.** Eight pregnant ewes (gestational age: 124-138 days, term 145-150 days) underwent hysterotomy under halothane/N<sub>2</sub>O/O<sub>2</sub> anesthesia. Cannulas were placed in a fetal femoral artery and vein, intra-uterine cavity, both maternal femoral arteries and both maternal femoral veins. An electromagnetic flow probe was placed around a main uterine artery and a Swan-Ganz catheter was placed in the maternal jugular vein. The animals were allowed to recover from the preparatory surgery for at least 24 hours before an experiment was performed. Following a stable thirty minute control period, 60 mg of chloroprocaine was injected intravenously. Maternal, uterine and fetal vascular dynamics were monitored continuously at 1,3,5,10,15,30,45 and 60 minutes after injection, maternal and fetal arterial blood samples were obtained for acid-base, local anesthetic and catecholamine determinations. In a similar manner, 120 mg, 180 mg and 240 mg of chloroprocaine were injected.

**Results.**

**A. Maternal:** With the 60 mg dose, there was a significant fall (14%) in cardiac output and a rise (15%) in total peripheral resistance lasting less than five minutes but the mean arterial pressure remained unchanged. With the 240 mg dose there was a drop (4%) in cardiac output and a (24%) rise in total peripheral resistance. There was a rise (13%) in mean arterial pressure lasting less than five minutes.

**B. Uterine Artery:** There was a dose-dependent decrease in uterine artery blood flow ranging from 15% with a 60 mg dose to 39% with a 240 mg dose. The peak decrease was at 1 minute and returned to control values in 10 minutes.

**C. Uterine Tone:** There was a dose-dependent increase in uterine tone ranging from 20% with a 60 mg dose to 90% with a 240 mg dose. The peak increase was at 1-3 minutes and returned to normal in less than 10 minutes.

**D. Fetus:** With increasing doses of chloroprocaine, there was a progressively greater fall in PaO<sub>2</sub>.

**E. Catecholamines:**

1.) Maternal - There was a dose-dependent increase in epinephrine and norepinephrine levels lasting ten minutes.

2.) Fetal - There was a dose-dependent increase in epinephrine and norepinephrine levels lasting less than thirty minutes.

**F. Chloroprocaine levels:** will be presented.

**Discussion:** The intravascular injection of a test dose (60 mg) of chloroprocaine in the chronic maternal-fetal sheep preparation resulted in a transient decrease in maternal cardiac output without affecting maternal and fetal acid-base status. The intravascular injection of a therapeutic dose (240 mg) of chloroprocaine resulted in a sustained fetal hypoxemia resulting from decreased uterine blood flow and increased uterine tone. Fetal reserve was sufficient to prevent severe acidemia.

**References:**

1. Morishima HO, Gutsche BB, Keenaghan JB, et al: The effect of lidocaine induced maternal convulsion on the fetal lamb, Abstracts, Annual Meeting, ASA, 1977, p. 293-294(7).
2. Craft JB, Co EG, Yonekura ML, et al: Intravenous injection of bupivacaine in the pregnant ewe, Abstracts, Annual Meeting, ASA, 1979, p. 5309.

Summary	Chloroprocaine IV	
	60 mg	240 mg
<b>Maternal</b>		
•AP	↓*	↑*
•CO	↓*	↓
•HR	↑*	↑
•SV	↓*	↓
•TPR	↑	↑
•Ut. Flow	↓	↓**
•Am p	↑	↑
ABG •pH	→	→
•pCO <sub>2</sub>	→	→
PO <sub>2</sub>	↓*	→
<b>Fetal</b>		
•AP	→	↑
•HR	→	→
ABG •pH	↓*	↓*
pCO <sub>2</sub>	→	→*
PO <sub>2</sub>	↓*	↓

\*p<0.05      \*\*p<0.01