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 Title : UPTAKE OF HALOTHANE IN THE FETAL LAMB IN UTERO
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Introduction: Although halothane is extensively used in obstetrical anesthesia little is known of the fetal uptake. The present study was undertaken to determine the fetal uptake of halothane when administered to the pregnant ewe at a constant inspired concentration.

Method: Six pregnant ewes of 125-135 days gestation had polyvinyl catheters placed in their femoral artery and vein during halothane in oxygen anesthesia. The uterus was exposed and a fetal limb withdrawn through a small hysterotomy. Catheters were placed in the fetal femoral and axillary artery and femoral vein. All catheters were tunneled to the maternal flank and the incisions closed. The animals recovered for 24 hours before they were studied. Just prior to each study a tracheostomy was done on the ewe with local anesthesia.

Maternal and fetal blood pressure and heart rate were recorded continuously during each experiment. Maternal and fetal blood gases and pH were measured every 15 minutes. The ewe breathed 100% oxygen via the tracheostomy for 30 minutes before adding a constant inspired concentration of 1.5% halothane to the maternal breathing circuit. Inspired and expired halothane concentrations were monitored with a Beckman infrared analyser. Maternal and fetal arterial blood halothane concentrations were measured by gas chromatography 2, 4, 8, 16, 32, 64, and 96 minutes after introducing halothane to the breathing circuit.

Results: Throughout halothane anesthesia, the maternal mean arterial blood pressure and pulse rate were not different from the awake control values. After 8 minutes of anesthesia fetal mean arterial blood pressure had decreased by 27% ($p < 0.05$) and remained decreased by 30% throughout the remainder of the study. Fetal pulse rate did not vary significantly from control.

During the control period the maternal pH, pCO_2 , and pO_2 were: 7.50 ± 0.04 , 28.1 ± 2.6 torr, 414 ± 10.5 mmHg

respectively. These values did not change significantly during the study. The fetal pH, pCO_2 , and pO_2 were 7.29 ± 0.02 , 44.1 ± 2.3 torr and 22.0 ± 1.7 torr during the control period and did not change significantly during the study.

The maternal arterial blood halothane concentration increased exponentially to 168.2 ± 25.8 mg/L after 96 minutes of anesthesia. The fetal halothane concentration rose in parallel with the mother's but only reached 112.2 ± 10.1 mg/L after 96 minutes (figure 1). Between 2 and 8 minutes of halothane administration the fetal concentration was only 36% of the mother's. After 96 minutes it was 66%.

Conclusion: The fetal uptake of halothane parallels that of the mother but is always considerably less. Initially the fetal concentration is only 36% of maternal and even at 96 minutes is only 66%.

Figure 1:
 MATERNAL AND FETAL ARTERIAL HALOTHANE CONCENTRATIONS DURING ADMINISTRATION OF 1.5% HALOTHANE TO THE EWES. (N=6) (Mean \pm S.E.)

