

156 Estimation of smoking and passive smoking mothers by cotinine measurement and its effect on fetal growth and neonates. T.Funakoshi, Y.Ueda, Kobayashi, S.Nakago, M.Yamasaki, H.Morikawa, M.Mochizuki, Dept.Obst.and Gynec., School of Med., Kobe Univ., Hyogo.

The effects of maternal passive smoking on pregnant women and their fetuses by measuring the concentrations of nicotine and cotinine, a metabolite of nicotine, were studied.

Cotinine concentrations in maternal urine, milk, umbilical blood and neonatal urine on 1st day of life increased progressively with the increase in passive smoking. And nicotine concentrations in maternal serum, milk and umbilical blood of smokers were significantly higher than that of non-smokers. The relative birth weight of the newborn infants delivered by the mothers whose cotinine concentration was more than 9.0ng/ml (the mean+1.5SD of the concentration in the urine from the mother who did not passively or actively smoke) was significantly lower than that of the mothers less than 9.0ng/ml.

In conclusions, it was suggested that the measurement of the cotinine concentration in maternal urine is very useful in estimating the effects of passive smoking on pregnant women. And passive smoking as well as active smoking has a harmful effect on the fetal growth mechanism.

157 Ovein Fetal and Maternal Glomeruli Atrial Natriuretic Peptide Receptors: Response to Dehydration. Y.Fujino, T.Sugawa, Dept. Obst. and Gynec., Osaka City Univ. Sch. Med., Osaka.

We characterized maternal and fetal glomerular atrial natriuretic peptide (ANP) receptor binding during the last trimester of sheep pregnancy and studied the effect of maternal dehydration on glomerular ANP binding characteristics. The ANP receptor maximum binding capacities (Bmax) in nine maternal-fetal pairs at 135 ± 1 days gestation were 83 ± 11 fmol/mg protein in maternal, and 34 ± 12 fmol/mg protein in fetal glomeruli, plasma ANP levels were 37 ± 3 pg/ml and 138 ± 20 pg/ml, respectively. The dissociation constants (Kd) for ANP binding were $2.7 \pm 0.6 \times 10^{-10}$ M and $3.7 \pm 1.7 \times 10^{-10}$ M for maternal and fetal glomeruli, respectively. In response to the dehydration for 63 ± 4 hours, the maternal plasma ANP levels decreased significantly from 37 pg/ml to 14 pg/ml ($P < 0.05$), and the Bmax of maternal glomerular ANP receptors increased significantly from 83 ± 11 fmol/mg protein to 732 ± 203 fmol/mg protein ($p < 0.05$). However, the fetal plasma ANP levels were not affected by the maternal dehydration, nor were the Kd or the Bmax of fetal glomerular ANP receptors. These results indicate that the pregnant sheep responds to dehydration with decreased plasma ANP levels and upregulation of renal ANP receptors. However, neither fetal plasma ANP levels nor renal ANP binding were altered.

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Study on brain damage of the experimental grows-retarded rat fetus.

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To clarify brain damage of the experimentally induced growth-retarded rat fetus, concentration of neuron specific enolase (NSE) and in the brain activity of acetylcholinesterase (AChE) were examined. Experimentally induced growth-retarded rat fetus was prepared by the method of Wigglesworth (Group A) or by maternal smoking (Group B). Samples (brains and cerebral fluid) were obtained on day 21 of gestation. An asymmetric type of IUGR was produced by Wigglesworth's method, and a symmetric one by maternal smoking. Both NSE concentration and AChE activity from normal brain increased as gestational age advanced until the 4th postnatal day examined. NSE content of IUGR brain was found to be significantly higher than that of the control (Group A: $P < 0.05$, Group B: $P < 0.001$). NSE content of cerebral fluid was the highest in Group A ($P < 0.05$). In contrast, AChE activity was significantly lower in IUGR than in the control (Group A: $P < 0.05$, Group B: $P < 0.001$). These findings suggest that increase in NSE content is a protective or regenerative response to chronic hypoxia in fetus brain and that decrease in AChE activity reflects decrease of neuron function.