21) Development of the Behavior in the Prewaning SHR Offspring Exposed to Alcohol in utero. Takuya Matsuo, Takahide Kihara and Takashi Tanimura, Department of Anatomy, Kinki University School of Medicine, Sayama-cho, Osaka 589.

The purpose of this study is to investigate the combined effects of hypertension and some of environmental factors on the behavioral development of offspring. Alcohol was chosen for the first environmental agent to be studied because of the importance of fetal alcohol syndrome. Offspring of SHR and WKY exposed to utero were tested for the preweaning behavioral and reflex development.

Rats of the SHR and WKY strains of 14 weeks of age were mated overnight. When the vaginal plug was found, the day was designated as day 0 of gestation. Pregnant rats were intubated throughout pregnancy twice daily (10:00 a.m. and 4:00 p.m.) with 2.4g of ETH (30% v/v) /kg body weight of day 0 of gestation. Controls were intubated with isocaloric sucrose(SUC) solution and pair-fed to ETH. One day after birth, all offspring were counted and weighed. At 4 days of age, they were culled to 8 pups per litter and weaned at 28 days of age. The male and female offspring of each group was examined for the following preweaning reflex tests from 4 to 13 days of age: the surface righting, cliff avoidance and negative geotaxis. Swimming development was examined for 8, 10, 12, 14, 16 and 21 days of age. Opening of eyelids was checked daily from 16 to 21 days of age.

ETH-SHR dams showed a considerably lower blood pressure compared to SUC-SHR at term. A steady decrease of blood pressure during pregnancy was observed in ETH-WKY, while that of SUC-WKY remained fairly constant. No significant difference was observed in the survival and weaning rates between ETH and SUC for both strains. Offspring of ETH-SHR showed the body weight increase similar to SUC-SHR during the preweaning period, but ETH-WKY offspring showed a lower tendency compared to SUC-WKY. In the surface righting and negative geotaxis reflexes, there were observed no significant differences between ETH and SUC for both SHR and WKY. In the cliff avoidance reflex, ETH-SHR showed a tendency of longer response time than SUC-SHR after 6 days of age, but ETH-WKY had shorter response time before 8 days of age. In the swimming development, ETH-SHR had increase of scores similar to SUC-SHR, but ETH-WKY remained lower in the scores compared to SUC-WKY. ETH groups of SHR and WKY showed a tendency of retardation of eyelid opening compared to respective SUC controls, but the differences were not significantly different.

In summary, WKY offspring exposed to ETH in utero showed a tendency of slower functional development in the preweaning period as measured by the angle score of swimming compared to the SUC-treated controls and this is concordance to the retarded physical development such as body weight increase and eyelid opening. However, they showed the superior development in one of the reflexes tested. On the contrary, ETH-treated SHR offspring did not show significant differences in the preweaning development compared to the SUC controls. This might be due to the complicated interaction of ETH exposure and hypertension of dams. Further studies of behavioral developmental tests in the postweaning period are in progress to clarify the significance of combined effects on offspring of ETH exposure in utero and hypertension of dams.