Studies on Pregnancy Hypertension and IUGR-SFD - Effects of Drugs on the Blood Vessels in the Placenta of Pregnant SHRSP (Stroke-Prone Spontaneously Hypertensive Rats) - Isao Fuchi, Department of Obstetrics and Gynecology, Kinki University, School of Medicine, Osaka-fu 589.

INTRODUCTION An important subject in current perinatal medicine is clarifying the factors behind, as well as the prevention of, IUGR and accompanying SFD infants. Since the conditions of pregnancy hypertension in SHRSP are similar to those in humans, in a previous study on clarifying the causing IUGR-SFD we examined the placenta of pregnant SHRSP. In this study we investigate the effects of those drugs previously found effective upon maternal blood vessels in the SHRSP placenta. We used an image analysis system, space Kontron MOP 20 to measure the cross-sectional area and wall thickness of the central blood vessel in the spiral artery.

MATERIALS AND METHODS Pregnant SHRSP and SHRSP-M (pregnant SHRSP injected 0.3ml/day MgSO4·7H2O after the 15th day of pregnancy), SHRSP-S (pregnant SHRSP injected 0.5ml/day Solcoseryl on the 11 to 15th days of pregnancy). SHRSP-K (pregnant SHRSP given 0.38% salt loading after the 11th day of pregnancy) and control WKY (Wistar-Kyoto rats) were used. Average rats, in regards to increases in body weights and in water and food intake, were used from each of these groups.

Laparotomies were performed on the 20th day of pregnancy. Liter sizes varied, but only rats with liters of between 9 and 11 babies are included in the analysis. For some of the specimens, gelatin-barium containing trypan blue was injected and fixed in formalin. The uterine artery and veins and the accessory blood vessels were ligated and cut. The entire pregnant uterine, including the fetuses, were removed. The portion of the placenta closest to the start of the uterine artery was used. The uterus and placenta were sliced horizontally and then stained with elastica van Gieson.

RESULTS 1) The cross-sectional area of the blood vessel's lumen is widest in WKY (81,129 ± 29,969μ²), less in SHRSP-M (68,117 ± 4,909μ²), SHRSP-K (66,138 ± 11,934μ²) and SHRSP-S (57,898 ± 2,723μ²), and narrowest in SHRSP (41,175 ± 6,627μ²).

2) The degree of blood vessel wall hypertrophy, i.e. wall thickness, was obtained by computing wall area ratio to total area. This is largest in SHRSP and becomes smaller in order of SHRSP-K, SHRSP-S, WKY and SHRSP-M. Based upon the results of the current experiment, it is thought that these three drugs enlarge the cross sectional area by working on the maternal blood vessels, and that especially MgSO4·7H2O relax the spasms of the maternal blood vessels. We tried to clarify the factors preventing IUGR-SFD in pregnancy hypertension, and found that the IUGR-SFD incidence rate is lower when these drugs are used.