64) Changes in plasma aldosterone and other phenomena in M-SHRSP, SHRSP and SHR. Yoshio Ohta, Nobuko Morita, Kazuo Yamamoto, Hiroki Shiokawa and Kozo Okamoto. Department of Pathology, Kinki University School of Medicine, Osaka-fu 589.

INTRODUCTION: It is recognized that patients with malignant hypertension secrete excessive amounts of aldosterone. While there have been various reports on aldosterone secretion in SHR there is little agreement in their data. Okamoto et al. recently established a strain of M-SHRSP which appear to be suitable models for studying malignant hypertension (ACTA MED KINKI UNIV 10: 73, 1985). The present study uses M-SHRSP and other SHR to clarify the relationships among blood pressures (BP), plasma aldosterone concentrations (PAC), plasma renin concentrations (PRC) and thickening of the zona glomerulosa.

MATERIALS AND METHODS: Six- to 12-week-old male M-SHRSP and 6- to 25-week-old SHRSP, SHR B₂ and WKY were used. BP was measured using the tail-pulse pickup method without anesthesia. Radioimmunoassay (Travenol, Dinabot) were used to assay PRC and PAC (Nasjletti and Masson: PROC SOC EXP MED 136: 344, 1971. Iinuma et al.: NIPPON NAIBUNPI GAKKAI 53: 797, 1977). All rats were sacrificed upon completion of the measurements. Both adrenal glands were immediately removed and fixed in 10% aqueous formaldehyde solution. Sections were stained with hematoxylin and eosin, Sudan III, oil red O and Nile blue sulphate. The thicknesses of the adrenal cortex (especially of the zona glomerulosa) were measured through image analysis (Kontron MOP-20).

RESULTS AND DISCUSSION: Twelve- and 25-week-old rat results are shown in the figure. Compared to other SHR, M-SHRSP evidence more rapid and severe increases in BP, PAC and PRC. M-SHRSP, SHRSP and SHR B₂ BP went over 210 mmHg at 8, 11 and 20 weeks of age, respectively, and reached around 250 mmHg at 10 weeks in M-SHRSP and at 15 weeks in SHRSP. Compared to WKY, M-SHRSP and SHRSP PAC increased significantly at 10 and 25 weeks, respectively, and was over 5 and 2.5 times that of WKY at 12 and 25 weeks of age. SHR B₂ PAC was almost the same as in WKY. On the other hand, PRC in M-SHRSP, SHRSP and SHR B₂ showed similar changes observed in PAC. In comparison to WKY, M-SHRSP and SHRSP PRC increased significantly at 10 and 12 weeks of age, and was around 7 and 4 times at 12 and 25 weeks, respectively. SHR B₂ PRC was almost same as in WKY. A scattergram was prepared and regression lines calculated for adult M-SHRSP and SHRSP with BP over 210 mmHg. This showed that there are significant, positive correlations among BP, PRC and PAC. Compared to WKY, the thickness of the zona glomerulosa in M-SHRSP and SHRSP increased significantly at 10 and 15 weeks of age, respectively. The zona glomerulosa in such rats consisted predominantly of cells with clear cytoplasm having abundant lipid droplets (cholesterol fat). The PAC and PRC levels of M-SHRSP maintained on 1% NaCl drinking water for one week were lower than those of a non-loaded, control group.

Blood pressure, plasma aldosterone, plasma renin in male I-M-SHRSP, SHRSP, SHR B₂ and WKY at 12 weeks of age (upper), and in SHRSP, SHR B₂ and WKY at 25 weeks of age (lower)

HaSE, (): No. of animals. *: significant difference from WKY ($p < 0.05$).