Comparison of Vascular Lesions among Various Tissues of Spontaneously Hypertensive Rats. Noboru Saito*, Teruhiko Okada**, Masatoshi Shiota*** and Shoji Nishiyama****. *Department of Geriatrics, **Department of Anatomy, ***Medical Research Laboratory and ****Department of Hygiene, Kochi Medical University, Kochi 783.

It is our purpose to clarify the difference of vascular lesions between various tissues of spontaneously hypertensive rats(SHR).

Methods In this study 8 male stroke-prone SHR (SHRSP) and 8 male Wistar Kyoto rats(WKY) were aged 9.5 months. Systolic blood pressure was measured by tail-cuff method. After taking blood samples under urethan anesthesia, kidney, testis, heart, liver, intestine with mesenteric artery, stomach, brain, lung, groin skeletal muscle and thoracic aorta were removed for preparing the microscopic specimens with Hematoxylin-Eosin staining. Then, graphic analysis with computer system (PC-PR 101F2 and et al) was used for calculating the areas of both vascular wall and vascular lumen using mesenteric artery and testis small artery.

Results Systolic blood pressure was 198 ± 15 mmHg ($M \pm SD$) in SHRSP and 118 ± 6 mmHg in WKY ($p < 0.005$). Cardiac weight per 100g of body weight was 0.49 ± 0.05 g in SHRSP and 0.34 ± 0.02 g in WKY ($p < 0.005$). Microscopically, 2 of 8 SHRSP showed periarteritis nodosa of mesenteric artery, and 3 SHRSP showed periarteritis nodosa of renal small artery or arteriole, while 6 SHRSP showed periarteritis nodosa with subintimal necrosis, indicating comparatively rapid occurrence of severe vascular lesions in testis small artery. Arterial wall hypertrophy was found in all SHRSP with the accumulated hyalinoid substances in tubular lumens. Cerebral softening and small bleeding were found in one SHRSP respectively, though any severe vascular change was not observed in cerebral small artery. Coronary artery of SHRSP showed only hypertrophy of vascular wall. Small arteries of intestine wall, liver and skeletal muscle did not show any distinct hypertrophy. On the contrary, WKY did not show vascular hypertrophy and lesions.

Using computer graphic analysis, the ratios of lumen area/wall area in testis small artery and mesenteric artery were lower in SHRSP (0.45 ± 0.33 in testis small artery, 0.28 ± 0.06 in mesenteric artery of SHRSP) as compared to WKY (1.03 ± 0.31 , 0.50 ± 0.15 respectively in WKY).

Summary In SHRSP aged 9.5 months, periarteritis nodosa of testis small artery, mesenteric artery and renal small artery or arteriole were found, especially indicating more prevalent occurrence of periarteritis nodosa in testis small artery. The ratios of lumen area/wall area were lower in testis small artery and mesenteric artery of SHRSP as compared to WKY, indicating the hypertrophic and severely damaged arteries.