5) Renal Tissue Lesions in Spontaneously Hypertensive Rats. Noboru Saito and Sakae Mukaino. Clinical Nutrition Laboratory, Faculty of Medicine, Kyoto University, Kyoto-city 606

We have studied the mechanism of hypertensive vascular lesions using spontaneously hypertensive rats (SHR) as experimental animals. SHR were fed either normal chow or high salt chow plus tap water. The rats were exsanguinated under ether anesthesia. The kidneys were removed and used for the histological specimens. The rats which underwent autopsy were also used. The specimens were made from the transversal midportion of SHR kidney. After fixation with neutral 10 % formalin, staining was performed with hematoxylin eosin or azan for microscopic examination. We observed the renal cortex microscopically by dividing it into two parts, namely the inner cortex and the outer cortex. In experiment 1, 11 male SHR aged 12 months and 7 male SHR aged 2 months were used. In experiment 2, 20 SHR aged 3 to 14 months of both sexes were fed either high salt chow or normal chow, which underwent autopsy within 24 hours after death. In experiment 3, 10 male SHR aged 6 months were fed high salt chow, and the control 10 SHR were fed normal chow. In experiment 4, 8 female SHR aged 7.5 months were fed high salt chow, and the control 5 SHR were fed normal chow. In experiment 5, 33 male SHR aged 2 to 12 months and 34 female SHR aged 1.5 to 18 months were fed normal chow. All SHR aged more than 6 months showed hypertension. The distributions of glomerular obsolescences were 95.6 ± 6.7 % (mean $\pm$ SD) in the inner cortex and 4.4 ± 6.7 % in the outer cortex in experiment 1, 74.4 ± 31.0 % and 25.6 ± 26.4 % respectively in experiment 2, 87.8 ± 17.1 % and 12.2 ± 17.1 % respectively in experiment 3, and 82.9 ± 13.5 % and 17.1 ± 13.5 % respectively in experiment 4. The differences of the distributions of glomerular obsolescences between the inner cortex and the outer cortex were significant. However, no glomerular obsolescences were observed in any of SHR aged 2 months in experiment 1 and in the control SHR in experiments 3 and 4. The numbers of glomerular obsolescences in the renal cortex were shown in the table. In experiment 5, glomerular obsolescences were observed in male SHR aged 10 to 12 months and in female SHR aged 8 to 18 months more often in the inner cortex than in the outer cortex, while younger SHR showed no glomerular obsolescences in the renal cortex. There were severe renal arterial and arteriolar lesions such as thickenings, cellular hyperplasia, hyalinosis and fibrinoid necrosis significantly more often in the inner cortex than in the outer cortex. We could observe glomerular obsolescences in the renal cortex, probably due to severe renal vascular lesions in SHR. High salt loading resulted in the acceleration of renal vascular and glomerular lesions in the renal cortex. The present findings may be related to the differences in renal vascular ramifications, in the autoregulations of renal circulation and in the effects of prostaglandins between the inner cortex and the outer cortex. It is also suggested that the presence of glomerular obsolescences shows the degree of renal tissue lesions in SHR, though glomerular obsolescences are not specific to hypertensive renal lesions.

	Age	Chow	The inner cortex	The outer cortex
Experiment 1	12 months	normal	7.2 ± 4.4	0.4 ± 0.5
	2	normal	0	0
Experiment 2	3 to 14	normal or high salt	5.4 ± 0.5	1.0 ± 1.2
Experiment 3	6	high salt	4.9 ± 4.5	0.8 ± 1.3
	6	normal	0	0
Experiment 4	7.5	high salt	7.4 ± 2.8	1.8 ± 1.5
	7.5	normal	0	0