30) Albumin and low molecular weight protein contents in the plasma, urine and kidney of young SHR.

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It has been reported that the kidney of young SHR exhibited the organic abnormality, and this may contribute to the development of hypertension in SHR. In the present study we measured the urinary protein excretion as an indicator of the abnormality of the kidney of young SHR.

Experiments were performed on male SHR at 3 and 4 weeks of age. For the collection of urine, each rat was individually housed in metabolic cage (Metabolica ST) for 24 hours. Albumin concentration of plasma, urine and kidney tissue (P_{Alb} , U_{Alb} and T_{Alb}), and low molecular weight protein concentration of plasma, urine and kidney tissue (P_{LMWP} , U_{LMWP} and T_{LMWP}) were measured by radioimmunoassay.

Results are summarized as follows,

	3W		4W	
	SHR	WKY	SHR	WKY
BP	—	—	141±14	112±8**
P_{Alb}	43.9±4.1	35.5±3.2**	40.7±14	41.6±10.4
P_{LMWP}	0.64±0.14	0.57±0.17	1.00±0.35	0.47±0.09*
U_{Alb}	287±197	76±39*	194±93	104±27**
U_{LMWP}	22.4±13.3	7.3±3.4**	30.6±12.1	34.8±22.1
T_{Alb}	21.3±3.4	24.6±4.5	—	—
T_{LMWP}	6.55±3.51	11.92±2.40	—	—
C_{cr}	0.69±0.26	1.22±0.29***	0.77±0.15	1.65±0.81**

m±SD, * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

BP: mmHg, P_{Alb} : mg/ml, P_{LMWP} : μ g/ml, U_{Alb} : μ g/mg creatinine,

U_{LMWP} : μ g/mg creatinine, T_{Alb} : ng/ μ g kidney weight,

T_{LMWP} : pg/ μ g kidney weight, C_{cr} : ml/min/100g body weight

At 3 and 4 weeks of age, when SHR are in borderline phase of hypertension, U_{Alb} were significantly increased in SHR compared to age-matched WKY. There results can't be explained by the difference of P_{Alb} between SHR and WKY. Moreover, since there are no difference of T_{Alb} between SHR and WKY, T_{Alb} also has not an effect on U_{Alb} .

In addition to the decreased C_{cr} in SHR, the increase in the filtration rate of albumin may suggest the abnormality of the glomerular filtration mechanism in prehypertensive SHR.