

Table 1. The Basal Blood Pressure and Renal Function Indices in WKYs and SHR

Parameter	(N = 26) WKY	(N = 29) SHR
Weight (g)	326 ± 6	308 ± 4*
MABP (mm Hg)	126 ± 4	160 ± 4*
GFR (mL/min)	1.7 ± 0.1	1.4 ± 0.1*
V (uL/min)	6.6 ± 0.3	5.3 ± 0.2*
U _{Na} V (uEq/min)	0.35 ± 0.05	0.14 ± 0.02*
U _K V (uEq/min)	1.10 ± 0.05	0.76 ± 0.04*
T ^C H ₂ O (uL/min)	32.8 ± 1.2	20.5 ± 1.1*

N = number of animals; MABP = mean arterial pressure; GFR = glomerular filtration rate; V = urine flow; U_{Na}V = absolute sodium excretion rate; U_KV = absolute potassium excretion rate; FE_{Na} = fractional sodium excretion rate; FE_K = fractional potassium excretion rate; T^CH₂O = free water reabsorption rate. Values are means ± SE., *P < 0.05 as compared with WKYs.

jected into lateral cerebral ventricles of rats. Immediately following injection of the drug, the accumulative water intake in 20 min was measured. Each treatment was separated by a 24 h interval.

Renal Function Experiment

Three days after completion of the conscious experiments, rats were anesthetized again with sodium pentobarbital to perform renal function test. The procedures of the renal function experiment were as previously described.²⁰ Mainly, the animal received a tracheotomy and cannulation of the urinary bladder. The rat was placed under a servo-controlled heated table to keep its core temperature at 37 °C. A prime dose of 0.3 ml 7.5% Inutest (polyfructosan, Laeavosan-Gesellschaft, Linz, Austria) in PBS was administered to the animal. An infusion of 3.75% Inutest at a rate of 0.02 mL/min was followed throughout the experiment. The animal was allowed to rest for an hour to achieve a steady state of urine flow. Throughout the experiment, each collection period of urine samples was 20 min. Urine samples of the control period were first collected for 40 min. After the control period, the rat received intracerebroventricular infusion with angiotensin peptides, with a concentration of 50 uM at infusion rate of 20 µL/h for 1 hour. An additional 40 min of recovery period were followed after angiotensin peptide administration. Blood samples (0.1 mL) were collected during the control and recovery periods for measurements

of sodium, potassium, osmolality, and inulin concentrations in plasma. The concentrations of inulin in plasma and urine samples were measured with a semimicroanthrone colorimetric technique.²¹ The electrolytes were measured with a flame photometer (Model 343, Instrumentation Lab., Lexington, MA, USA). The osmolality was measured with an osmometer (Model 3MO, Advanced Instrument, Needham Heights, MA, USA).

After the recovery period, the animal was sacrificed with an overdose of sodium pentobarbitals and the wet weights of both kidneys were measured. Placement of the lateral cerebroventricular cannula was checked by an injection of 10 µL gentian violet into the cannula. Correct placement was verified by the presence of dye in the cerebroventricular system.

Data Analysis

The glomerular filtration rate (GFR), absolute sodium excretion rate (U_{Na}V), absolute potassium excretion rate (U_KV), fractional sodium excretion rate (FE_{Na}), fractional potassium excretion rate (FE_K), and free water reabsorption rate (T^CH₂O) were computed according to the standard clearance formula. Data are expressed as means ± SEM. Analysis of variance with Student-Newman-Keuls' post-test procedure was used to evaluate whether there were differences in blood pressures, heart rates, and renal excretions between animal groups. Paired Student's *t*-test was used to evaluate renal function before and after angiotensin II infusion. Statistical significance was assumed when *p* < 0.05.

RESULTS

Table 1 shows that the averaged body weights of WKYs and SHRs were 326 ± 6 and 308 ± 4 g, respectively. SHRs revealed lower body weight than WKYs. The baseline MABP of conscious WKYs and SHRs were 126 ± 4 and 160 ± 4 mm Hg, respectively. SHRs possessed significantly higher MABP than did WKYs. All of the baseline renal function indices of SHRs were lower than those of WKYs.

Pressor Effect of Angiotensin Peptides

As shown in Fig. 1, intravenous injection of Ang II