The Changes of Renal Cortical Blood Flow in Spontaneously Hypertensive Rats. Noboru Saito and Toshio Ozawa. Department of Geriatrics, Kochi Medical School, Kochi 781-51

It is our purpose to investigate the effects of blood pressure changes or various vasoactive substances on renal cortical blood flow (RCBF).

Spontaneously hypertensive rats (SHR) and Wistar Kyoto Rats (WKY) were anesthetized with urethane (1g/kg). A catheter was inserted into rat carotid artery for measuring blood pressure with the electrical manometer. The injected agents were flushed through rat femoral vein. Two platinum electrodes of 200µ in the diameter were fixed in 0.5 to 1 mm and in 1.8 to 2.5 mm from renal capsular surface. The places of the electrodes were confirmed by microscopical examination of renal tissue specimens with hematoxylin-eosin staining. Hydrogen gas was inspired through rat upper airway for 3 to 8 seconds, and hydrogen clearance was measured with PH2 monitor, PHG-300, Tokai Irika, for calculating RCBF by Fick's principle. 1) Painful stimulations with scissors in the femoral muscles elicited the elevation of blood pressure in female SHR aged 10 months. In 90 to 100 mmHg of mean blood pressure (MBP), RCBF was 116 ± 13 (M ± SD) (7 cases) ml/min/100g in the inner part and 282 ± 18 (7) ml/min/100g in the outer part of renal cortex. In 101 to 120 mmHg of MBP, RCBF was 149 ± 17 (7) ml/min/100g and 322 ± 19 (7) ml/min/100g respectively. The elevation of mean blood pressure increased RCBF significantly. 2) By physiological saline solutions from 0.3 to 2 ml, RCBF in the inner part of renal cortex increased from 185 ± 7 (5) ml/min/100g to 201 ± 20 (5) ml/min/100g significantly. RCBF in the outer part increased from 233 ± 7 (5) ml/min/100g to 247 ± 25 (5) ml/min/100g, but not significantly. 3) By intravenous trimethazidine in 0.1 to 0.2 mg, 2 mg or 5 mg, RCBF did not change significantly as compared with the cases of physiological saline solution, although mean blood pressure decreased significantly by 5 mg of trimethazidine. When RCBF were expressed as 100 % in the cases of physiological saline solution, 98.3 ± 4.6 % in the inner part of renal cortex and 99.3 ± 5.8 % in the outer part were shown in three SHR, and 89.7 ± 12.1 % in the inner part and 85 ± 19.7 % in the outer part were shown in four WKY. These changes were not significant.