41) Role of prostaglandins in natriuresis of perfused kidney in SHR.
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Natriuresis, an important function of the kidney, may be a major factor to regulate systemic blood pressure in human and animals. In this study, it was evaluated that the role of prostaglandins (PGs) in natriuresis of in situ perfused kidney of normotensive Wistar rat (NWR) and SHR after sodium loading.

METHODS : SHR (age:9-11 weeks) and age matched NWR were fed on regular sodium (0.86% NaCl) or high sodium diet (8% NaCl) for 2 weeks. Left kidney was perfused in situ with Krebs-Ringer bicarbonate buffer. In this perfusion system, urine volume and urinary sodium output (per min, per g.wet weight) were measured in constant flow rate (4.3ml/min) or in variable perfusion pressure (60-120 mmHg) respectively. Indomethacin (5mg/kg), inhibitor of PGs biosynthesis, was administered intravenously at 30 min prior to perfusion. Systolic blood pressure was measured by tail-cuff method.

RESULTS : Systolic blood pressure of SHR increased significantly after sodium loading as compared with the stage of regular sodium diet, but no significant change was observed in NWR after sodium loading. In constant flow rate of perfusion, water and sodium excretion of SHR reduced significantly as compared with NWR in regular sodium diet and after high sodium diet. After sodium loading, excretion of water and sodium increased significantly in both SHR and NWR as compared with the stage of regular sodium diet, however augmented natriuresis induced by sodium loading in SHR was significantly low as compared with NWR. In regular sodium diet, pressure-natriuresis curve of SHR obtained in the pressure range of 60-120 mmHg shifted to right as compared with that of NWR. Moreover, this curve shifted to left in both SHR and NWR after sodium loading from that in the stage of regular sodium diet. On the other hand, pretreatment with indomethacin after high sodium loading suppressed the augmented natriuresis in both SHR and NWR. These findings indicated that water diuresis and natriuresis of SHR was reduced in this perfusion system, and augmented natriuresis induced by sodium loading was suppressed by indomethacin pretreatment in SHR and NWR respectively.

From these findings, it was considered that the function of kidney was impaired in the perfusion pressure range of 60 to 120 mmHg in SHR, but natriuretic response in higher perfusion pressure was not performed in present studies. The fact that augmented natriuresis observed after high sodium loading in SHR and NWR was disappeared by the pretreatment of indomethacin, may suggest an important role of PGs on natriuresis after sodium loading.