F-E5

Altered Regulation of Renal Nitric Oxide, Atrial Natriuretic Peptide and Cyclooxygenase Systems in Aldosterone Escape in Rats

전남대학교 의과대학 내과학교실[1], 전남대학교 의과대학 생리학교실[2]

배은희[1] · 조현지[2] · 김인진[2] · 박정우[1] · 마성권[1] · 이종은[2] · 김수완[1]

Altered Regulation of Renal Nitric Oxide, Atrial Natriuretic Peptide and Cyclooxygenase Systems in Aldosterone Escape in Rats

Eun Hui Bae[1], Hyun Ji Cho[2], In Jin Kim[2], Jeong Woo Park[1]
Seong Kwon Ma[1], JongUn Lee[2], Soo Wan Kim[1]

Department of Internal Medicine[1] Chonnam National University Medical School
Department of Physiology[2] Chonnam National University Medical School

The present study was aimed to determine whether there is an altered role of local nitric oxide (NO), atrial natriuretic peptide (ANP) and cyclooxygenase (COX) systems in the kidney in association with the aldosterone escape. Male Sprague-Dawley rats were used. Aldosterone (200 g/day) was infused through entire time course. The control group was kept on a low sodium diet (0.02 mEq/day), and the experimental group was supplied with a higher sodium diet (2.0 mEq/day). Four days after beginning the regimen, the kidneys were taken. The protein expression of NO synthase (NOS) and COX isoforms was determined by semiquantitative immunoblotting. The mRNA expression of components of ANP system was determined by real-time polymerase chain reaction. The activities of soluble and particulate guanylyl cyclases were determined by the amount of cGMP generated in responses to sodium nitroprusside and ANP, respectively. There developed aldosterone escape in the experimental group. Accordingly, the renal content and the urinary excretion of NO increased. The expression of nNOS was increased in the inner medulla. Neither the expression of eNOS nor that of iNOS was changed. The expression and the catalytic activity of soluble guanylyl cyclase remained unaltered. The mRNA expression of ANP was increased. Neither the expression of NPR-A or NPR-C nor the activity of particulate guanylyl cyclase was altered in the papilla. The protein expression of COX-2 was increased in the inner medulla, while that of COX-1 remained unchanged. In conclusion, the upregulation of nNOS, ANP, and COX- 2 may be causally related with the aldosterone escape.

Key Words : Aldosterone escape, 산화질소, ANP
Aldosterone escape, Nitric oxide, Atrial natriuretic peptide