P-206

Altered Regulation of Renal Nitric Oxide and Atrial Natriuretic Peptide Systems in Lipopolisaccharide-induced Kidney Injury

Eun Hui Bae[1], Joon Seok Choi[1], Chang Seong Kim[1]
Jeong Woo Park[1], Seong Kwon Ma[1], JongUn Lee[2], Soo Wan Kim[1]

Departments of Internal Medicine[1], Departments of Internal Physiology[2]
Chonnam National University Medical School Gwangju Republic of Korea

The present study was aimed to determine whether there is an altered role of local nitric oxide (NO) and atrial natriuretic peptide (ANP) systems associated with phosphodiesterase 5 (PDE5) in the kidney in association with the lipopolysaccharide (LPS)-induced kidney injury rats. Male Sprague-Dawley rats were used. LPS (10 mg · kg-1) was injected via tail vein. The 12 hours later, the kidneys were taken. The protein expression of NO synthase (NOS), neutral endopeptidase (NEP) and PDE5 was determined by semiquantitative immunoblotting. The mRNA expression of ANP system was determined by real-time polymerase chain reaction. Guanylyl cyclases activity was determined by the amount of cGMP generated in responses to sodium nitroprusside (SNP) and ANP, in state of with IBMX or without IBMX. Creatinine clearance was decreased, and fractional excretion of sodium was increased in the experimental group. The protein expression of PDE 5 was decreased, and inducible NOS was increased in LPS rats, while that of endothelial NOS, neuronal NOS and NEP showed no difference between two groups. The plasma and urinary excretion of NO increased in LPS rats. The expression and catalytic activity of soluble guanylyl cyclase remained unaltered in the glomerulus and papilla in LPS rats with IBMX or without IBMX. The mRNA expression of NPR-C was decreased in LPS rats, while the expression of ANP and NPR-A was not changed. The activity of particulate guanylyl cyclase was blunted in the glomerulus and papilla, while it was recovered without IBMX state in LPS rats. In conclusion, the upregulation of iNOS and decreased PDE 5 activity may contribute to phathogenesis of LPS-induced kidney injury.

Key Words: Guanylyl cyclase
Lipopolysaccharide, Atrial natriuretic peptide, Nitric oxide