F-D6

The Renoprotective Effect of Paricalcitol on Gentamicin-Induced Nephropathy in Rats

전남대학교 의과대학 내과학교실[1], 생리학교실[2]

박정우[1] · 배은희[1] · 김인진[1] · 이종은[2] · 최기철[1] · 김수완[1]

The Renoprotective Effect of Paricalcitol on Gentamicin-Induced Nephropathy in Rats

Jeong Woo Park[1], Eun Hui Bae[1], In Jin Kim[1], JongUn Lee[2], Ki Chul Choi[1] and Soo Wan Kim[1]

Departments of Internal Medicine[1] and Physiology[2], Chonnam National University Medical School

Background : It has been suggested that vitamin D plays a beneficial role in renal disease progression. We investigated the effects of paricalcitol (19- nor- 1,25- hydroxyvitamin D2) on renal dysfunction and tissue injury in gentamicin (GM)- induced nephropathy.

Methods : Male Sprague- Dawley rats were treated with gentamicin (100 mg/kg/day, i.m.), in which one group was co- treated with paricalcitol (0.03 ug/kg/day, s.c.) and the other was not. Fourteen days later, the expression of α 1 subunit of Na,K- ATPase, type 3 Na^+/H^+ exchanger (NHE3), aquaporin 1 (AQP 1) and transforming growth factor β (TGFβ) was determined in the kidney by semiquantitative immunoblotting and immunohistochemistry. Renal eNOS and nNOS expression was determined by Western blot analysis.

Results : GM treatment resulted in a renal dysfunction evidenced by an increase of serum creatinine concentration along with a decrease of its clearance (Ccr). The urine volume was increased and urine osmolality and urine to plasma osmolality ratio (U/Posm) decreased, indicating an impaired urinary concentrating ability. Ccr was improved and urine volume decreased by paricalcitol treatment, although U/Psom was not significantly changed. GM treatment decreased the expression of Na,K- ATPase α 1, NHE3 and AQP1 in the cortex and outer medulla. The protein expression of eNOS was increased, while that of nNOS decreased in the cortex. The expression of TGFβ was increased in the cortex. Paricalcitol treatment attenuated the altered expression Na,K- ATPase α 1, NHE3, AQP 1, NOSs, and TGFβ in the GM treated rats. Immunohistochemistry showed similar results as the immunoblot study.

Conclusion : Paricalcitol treatment may prevent GM- induced downregulation of renal AQPs and sodium transporters, possibly through preserving the activities of NO systems and inhibiting the TGFβ expression.

Key Words : Gentamicin, Paricalcitol, 신독성
Gentamicin, Paricalcitol, Nephropathy