Renal Denervation Attenuates the Development of Hypertension along with Diminished Expression of Aquaporin Water Channels in Rats Treated with Deoxycorticosterone Acetate (DOCA)-salt

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Background : The present study was aimed to examine whether there exists a sympathetic neural mechanism in the regulation of renal aquaporin (AQP) water channels.

Methods : Male Sprague-Dawley rats were developed of DOCA-salt hypertension. One group of DOCA-salt rats was renal nerve denervated before inducing the hypertension. The protein expressions of AQP1, AQP2 and AQP3 were determined in the kidney by Western blot analysis.

Results : Following the treatment with DOCA-salt, the expression of AQP1 and AQP2 was significantly increased in the inner medulla. The renal nerve denervation attenuated the development of hypertension. Accordingly, the magnitude of increase of AQP channels was decreased.

Conclusion : These results suggest that the sympathetic nervous system has a tonic excitatory effect in the regulation of AQP water channels in the kidney.