Calcitonin Gene-Related Peptide and Sympathetic Nervous System in Hypertension-Induced Renal Damage

To the Editor:

We read with great interest the recent article by Bowers et al dealing with the role of calcitonin gene-related peptide (CGRP) in hypertension-induced renal damage. The results of their study demonstrated that the deoxycorticosterone (DOC)-salt hypertensive α-CGRP knockout (KO) mice displayed markedly enhanced and progressive renal damage and expression of inflammatory markers in the immunohistochiostatic investigation. In addition, they indicated that the DOC-salt hypertensive α-CGRP KO mice exhibited elevated urinary biomarkers of oxidative stress and a marked reduction in kidney function compared with the DOC-salt wild-type mice. The authors proposed that sensory nerves, via α-CGRP, might be renoprotective against hypertension-induced damage.

Several studies have reported that enhanced activity of sympathetic nervous system might actively participate in the pathogenesis of renal damage in hypertension. In a study we presented previously, the change in norepinephrine (NE) release induced by α-CGRP was investigated in rat central nervous system. In an in vitro study, we showed that α-CGRP inhibited the stimulation-evoked NE release in a dose-dependent manner. It was also demonstrated that a dihydropyridine-sensitive calcium (Ca) channel agonist Bay K 8644 significantly reversed the inhibitory effect of α-CGRP on NE release, indicating that α-CGRP might partially interact with dihydropyridine-sensitive Ca channels and modulate intracellular Ca mobilization. Furthermore, we showed that the inhibitory action of α-CGRP on NE release was significantly attenuated in spontaneously hypertensive rats. In the peripheral tissues, Ohhashi and Jacobowitz observed that α-CGRP reduced the electrical stimulation–induced contraction of rat vas deferens, suggesting that α-CGRP might inhibit NE release during adrenergic nerve stimulation. It can be speculated that impaired modulation of NE release in the absence of α-CGRP might cause sympathetic hyperactivity and could contribute, at least in part, to the pathogenesis of renal damage. Therefore, we would like to know whether changes in sympathetic nervous activity might be correlated with the magnitude of renal damage in the DOC-salt hypertensive α-CGRP KO mice in the present study of Bowers et al. Further studies should be performed to assess more thoroughly the interactions between CGRP-containing sensory nerves and sympathetic nervous system and their role in hypertension-induced renal damage.

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