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The Efficacy of Renal Denervation for the Stroke Onset in Salt-Sensitive Hypertension
－Renal Denervation Prevents Stroke Onset in Salt-Sensitive Hypertension－

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Summary

Background and purpose: Although renal denervation (RD) is reported to reduce the blood pressure in treatment-resistant hypertensive patients, the beneficial effect of RD for stroke onset is undetermined. In the current study, we hypothesized that RD prevents stroke onset in salt-loaded hypertensive rats.

Methods: Seventy-two spontaneously hypertensive stroke-prone (SHRSP) rats were assigned to normal salt diet (0.3% Na) and high salt diet (8% NA) with sham-operation, RD, or hydralazine (5mg/kg/day). Firstly, neurological symptom including paralytic gait, reduced motor activity, and sudden death was monitored every day for 42 days and the rats were regarded as stroke sign-positive if they showed one or more of these signs. Blood pressure among the groups was checked for 14 days using tail cuff methods. Next, to address the effect of RD, the animals were measured cerebral blood flow (CBF) and then their brain were evaluated Immunoglobulin G (IgG) and dihydroethidium staining at 21 days after salt-loaded. Western blotting for occluding, $p67^{phox}$, Rac1 were also conducted at the same time point. In addition, we assessed the plasma renin activity and renal noradrenalin levels of the rats.

Results: RD significantly reduced not only stroke onset and mortality but also blood pressure compared with the sham group. There was no stroke onset in normal salt diet group. RD preserved CBF and occluding expression, and decreased the density of IgG staining. Also, RD reduced the density of dihydroethidium on hypothalamic paraventricular nucleus and cortex, $p67^{phox}$ and Rac1 expressions. Although blood pressure was significantly decreased in the hydralazine group, there were no beneficial effects in that group. Plasma renin activity and renal noradrenalin levels in RD group were lower than in the sham group.

Conclusions: RD could prevent stroke onset in salt-loaded hypertensive rats beyond the blood pressure lowering. The effects might be associated with stabilization of cerebral vessels, reduction of oxidative stress in hypothalamic paraventricular nucleus and cortex, and inhibition of renin-angiotensin system.