HYPERTENSION

The Symplicity of renal denervation for patients with treatment-refractory hypertension

A new study published in *The Lancet* has demonstrated that catheter-based renal sympathetic denervation is a viable treatment option for patients with uncontrolled high blood pressure. Short bursts of low-power radiofrequency to the main renal arteries can reduce sympathetic activity and renin release, leading to a decrease in blood pressure and preventing sequelae of hypertension.

The Symplicity HTN-2 investigators assessed the safety and effectiveness of renal denervation in patients with a systolic blood pressure ≥160 mmHg (≥150 mmHg in patients with type 2 diabetes) on three or more antihypertensive therapies. In total, 106 patients from 24 centers were randomly assigned to either undergo renal denervation together with previous treatment or to maintain previous treatment alone (control group). Office-based measurements of blood pressure, serum creatinine concentration, cystatin C concentration, and urine albumin-to-creatinine ratio were assessed at 1 month, 3 months, and 6 months.

The primary end point of between-group change in mean systolic blood pressure from baseline to 6 months after randomization was analyzed for 49 patients who underwent renal denervation and 51 patients in the control group. Office-based blood pressure measurements in the renal denervation group decreased significantly by 32/12 mmHg at 6 months. By contrast, blood pressure did not change from baseline in the control group. Home-based measurements and 24 h ambulatory blood pressure recordings showed similar trends. The secondary end points included procedural safety and a composite cardiovascular end point. Renal denervation was carried out without any serious procedure-related adverse events and seemed to be safe even in those with mild to moderately impaired renal function at baseline. "Our randomized, controlled trial confirms the role of renal sympathetic nerves in essential hypertension and validates a new therapy for treatment-resistant hypertension," write the authors. One limitation of the technique is that nerve regrowth could blunt treatment effects, although functional reinnervation of the human kidney has not been shown to date. The authors predict that future trials will study the effectiveness of renal denervation in patients with mild essential hypertension, and in other diseases in which renal sympathetic outflow is activated.

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Original article Symplicity HTN-2 Investigators. Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 Trial): a randomised controlled trial. *Lancet* **376**, 1903–1909 (2010)