The Effect of Renal Denervation on Systemic Hypertension and Left Ventricle Diastolic Function

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Background: Sympathetic nervous system(SNS) activation is involved in the development and progression of systemic hypertension.The response of the kidneys to SNS signaling increases blood pressure by increase of rennin secretion, decrease of sodium excretion and induction of renal vasoconstriction. Activation of the renal somatic afferent nerves leads to elevated central sympathetic drive. First experience with bilateral renal artery denervation showed significant decrease of the systolic and diastolic blood pressure in resistant hypertension .
Hypothesis: Bilateral renal artery denervation can reduce significantly blood pressure in patients who are resistant to at least three antihypertensive medications and can improve left ventricle diastolic function.
Methods and results: Nine patients with resistant hypertension were treated with catheter-based approach by using radiofrequency energy delivered throw the Simplicity catheter of Medtronic to both renal arteries. Blood pressure, pulse, systolic and diastolic left ventricle function measurements were schedualed after one month, three months and six months follow up.
Results: The mean systolic blood pressure at baseline was 169±19 mmhg, mean diastolic blood pressure 81±15 mmhg. The mean systolic blood pressure one month after renal denervation was 134±21 mmhg ,mean diastolic blood pressure 77±11 mmhg. By using paired t test there was significant reduction of the systolic blood pressure by 21% with P value of 0.005 .There was nonsignificant 5% reduction in diastolic blood pressure (P value=0.638). There was no effect on the left ventricle diastolic function after one month but we expect improvement of the diastolic features in the medium and long term.
Conclusion: Bilateral renal arteries denervation is associated with significant reduction in systolic blood pressure one month after this intervention. Results of the effect of renal denervation on left ventricle diastolic function will be available in three to four months.