Limitted Effects of Renal Denervation in Resistant Hypertension

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INTRODUCTION

Optimal therapy for patients with controlled apparent treatment-resistant hypertension (RH) was defined as prescription of a diuretic and three or more other blood-pressure medications, with each medication at ≥50% of the maximum recommended or approved dose for hypertension. Approximately 1 in 7 of all uncontrolled hypertensives and 1 in 2 with uncontrolled RH are prescribed ≥3 BP medications in optimal regimens. Renal Denervation (RDN), an endovascular catheter-based intervention, is being applied as a novel concomitant treatment of drug-resistant hypertension. However, with underpowered efficacy and safety data currently available. The aim of this study was to evaluate the duration of the blood pressure (BP) lowering effect of RDN and reduction of antihypertensive drug classes needed after intervention.

SUBJECTS AND METHODS

Office BP measurements at 1, 3 and 6 months follow-up visits were compared to baseline values in 7 patients with RH. Also, the number of antihypertensive drug classes before and 6 months after RDN were evaluated. We used STATISTICA 10, 2011 software (Stat Soft Inc., Tulsa, OK, USA). Values are mean ± SD and considered statistically significant if $P < 0.001$.

RESULTS

At baseline, values were 62 ± 6 years for age, 184 ± 21 mmHg and 106 ± 26 mmHg for systolic and diastolic BP, respectively; and 6.7 ± 1 for number of antihypertensive drug classes. One, 3 and 6 months after RDN, office SBP values were significantly lower (144 ± 13 mmHg, 140 ± 17 mmHg and 141 ± 15 mmHg, respectively; $P < 0.001$). However, with no significant reduction in DBP values at 1, 3 and 6 months after RDN (81 ± 6 mmHg, 82 ± 9 mmHg and 79 ± 9 mmHg, respectively; $P < 0.05$). Six months after RDN the number of antihypertensive drug classes required was 6.5 ± 1 which was not statistically different from baseline.

Table 1: Baseline clinical characteristics and biochemical measures of all patients treated with RDN method (n =7)

Variable	Data
Age (yrs)	62 ± 6
Women	5/7
Type 2 diabetes	4/7
Body mass index (kg/m^2)	32 ± 2
Antihypertensive drugs (n)	7 ± 1
ACEI	3/7
ARB	5/7
ACEI and ARB	0/7
β - blocker	5/7
Calcium-channel blocker	7/7
α - blockers	5/7
Diuretic	7/7
Direct renin inhibitor	0/7
Vasodilator	2/7
Central acting sympatholytic	7/7
Office SBP (mmHg)	184 ± 21
Office DBP (mmHg)	106 ± 26
Heart rate (beats/min)	67 ± 6
eGFR (mL/min per 1.73m^2)	65 ± 38
Plasma creatinine (μmol/L)	108 ± 61

Values are mean ± SD or number/number of patients. ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; DBP, diastolic blood pressure; eGFR, estimated glomerular filtration rate (MDRD formula); SBP, systolic blood pressure.

DISCUSSION

To improve treatment of uncontrolled hypertension, physicians should search for secondary causes of hypertension, rule out white-coat hypertension, expend energy to improve patient compliance, and "prescribe an optimal drug regimen and adequate dosage.The sustained reduction of office SBP was observed during 6 months after the RDN. For better understanding the efficacy and safety of RDN we need well structured randomized clinical trials in patients with rHT and various co-morbidities. Also, further meta-analysis to evaluate the optimal target population and importance of RSD as RH treatment.

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