Renal denervation in patients with resistant hypertension

AKADEMISK AVHANDLING

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Avhandlingen baseras på följande delarbeten

I. Völz S, Svedlund D, Andersson B, Gan LM, Rundqvist B.
Coronary flow reserve in patients with resistant hypertension
Clinical Research in Cardiology 2017 Feb; 106(2):151-157

II. Völz S, Rundqvist B, Ljungman C, Andersson B, Gan LM, Svedlund S
Effects of renal denervation on coronary flow reserve in patients with resistant hypertension. Submitted.

III. Völz S, Spaak J, Gottsäter A, Jägren C, Lundin C, Stenborg A, Andersson J, Rundqvist B, Kahan T, Andersson B. *Renal sympathetic denervation in Sweden: A first report from the Swedish Registry for Renal Denervation*. Journal of Hypertension 2018 Jan; 36(1):151-158

IV. Völz S, Lundblad L, Andersson B, Multing J, Rundqvist B, Elam M
Muscle sympathetic nerve activity at rest and during mental stress in patients with resistant hypertension: before and after renal denervation. Submitted.

SAHLGRENSKA AKADEMIN

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ABSTRACT

BACKGROUND

Catheter-based renal denervation (RDN) is a potential modality in the treatment of patients with resistant hypertension (RH). The biological effects of RDN are not fully comprehended and studies examining its impact on blood pressure (BP) and other cardiovascular surrogate markers have generated conflicting results.

AIMS

Study I aimed to assess coronary flow reserve (CFR) in patients with RH. Study II was performed in order to estimate the effect of RDN on CFR. In Study III, we examined the safety and efficacy of RDN in a real-world setting. Study IV aimed to estimate the impact of RDN on muscle sympathetic nerve activity (MSNA).

METHODS

We assessed CFR in 25 patients with RH and matched controls with controlled hypertension in Study I. In Study II, we used the same modality in 26 patients with RH, before and six months after RDN. In Study III, we used data from the Swedish Registry for Renal Denervation. In Study IV, we assessed MSNA at rest and during mental stress in patients with RH before and six months after intervention.

RESULTS

RH was associated with impaired CFR as compared to patients with controlled hypertension (I). Despite a significant reduction in BP, we did not detect any significant changes in CFR six months after RDN (II). Registry analysis showed significant reduction in office and ambulatory blood pressure six months after RDN. The procedure proved feasible and was associated with a low complication rate (III). No significant changes in MSNA at rest and mental stress were noted at six-month follow-up (IV).

CONCLUSIONS

RH is associated with an impairment of the coronary microcirculation, which may contribute to the increased risk of cardiovascular events in this patient group. RDN did not change the course of CFR, despite a significant reduction in BP. Registry data suggest a sustained reduction in both office and ambulatory BP. MSNA was unchanged at follow-up, which raises questions about the biological effects of RDN and its impact on the autonomous nervous system.

KEYWORDS

Blood pressure, hypertension, renal hypertension, autonomic denervation, sympathectomy, sympathetic nervous system/pathophysiology, Doppler echocardiography

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