Renal denervation in patients with resistant hypertension

AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs Universitet kommer att officiellt försvaras i hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, Göteborg den 9. mars 2018, klockan 13.00 av

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Avhandlingen baseras på följande delarbeten


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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

ISBN: 978-91-629-0392-3 (TRYCK)
ISBN: 978-91-629-0393-0 (PDF)