ENGLISH SUMMARY

Endovascular renal denervation in the treatment of treatment-resistant hypertension

KAJ METSÄRINNE
TIMO MÄKIKALLIO
NEILL BOOTH
HELI MAJAMAA
JAANA ISOJÄRVI

RISTO P. ROINE
Group Administration, Helsinki and Uusimaa Hospital District
E-mail: risto.p.roine@hus.fi

Background

Hypertension is an established risk factor for cardiovascular diseases. The usual treatment of hypertension comprises lifestyle changes and antihypertensive medication. Treatment has unequivocally been shown to improve the prognosis of hypertensive patients. In a small minority of patients antihypertensive medication, however, does not adequately control blood pressure, and hypertension is defined as treatment-resistant when systolic blood pressure in treatment compliant patients remains elevated above 160 mmHg (in diabetics over 150 mm Hg) despite three antihypertensive medications (of which one is a diuretic).

Surgical sympathectomy is an effective means to control treatment-resistant hypertension. Endovascular renal denervation has in recent years been studied as an alternative to surgical sympathectomy. It is a minimally invasive, catheter-based procedure that employs radio frequency ablation of the renal arteries to denervate nerves of the vascular wall, and to thus reduce renal sympathetic afferent and efferent activity and lower blood pressure.

Aim

To establish whether endovascular renal denervation is an effective and safe option for the treatment of serious, treatment-resistant hypertension.

Methods

A systematic literature review with searches of the Medline-, Cochrane Central, Cochrane Database of Systematic Reviews- and CRD (DARE, HTA and NHS EED) –databases. Included were articles describing studies with at least 10 patients and a minimum follow-up of six months. Of the 314 articles identified by the literature search, 13 fulfilled the inclusion criteria. They reported the results of two randomized controlled trials (2–3), three partly controlled trials (4–6), and eight observational studies (7–14).

Effectiveness

The decrease in blood pressure was fairly consistent in the included studies. Systolic blood pressure decreased by more than 10 mmHg in 80-90 % of the patients. In the largest trials (2,4–5,8,10,14) the blood pressure decrease six months after the procedure averaged -29/-11 mmHg (systolic/diastolic, range 25–32/8–12 mmHg). Only two studies followed up patients until 12 months (8,10), the average blood pressure decrease in them being -23/-11 mmHg and -33/-19 mmHg, respectively. In studies employing 24-hour blood pressure monitoring, the effect of renal denervation was however much smaller (10–11). In a small study (10) renal denervation was shown to effectively lower blood pressure also in patients with renal insufficiency without affecting kidney function negatively.

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Safety

Adverse events related to the procedure were rare. Isolated adverse events included pseudoaneurysms at the femoral access site and two renal artery dissections. No major adverse events were reported.

Conclusion

Most of the studies had been financially supported by the manufacturer of the treatment catheters, which needs to be taken into account when appraising the results. Renal denervation appears to be an effective treatment option in about 90% of patients with treatment-resistant hypertension. Moreover, the effect appears long-lasting although the number of patients with a long follow-up is still small. In light of ambulatory 24-hour blood pressure monitoring results, blood pressure decrease after renal denervation, however, appears more modest. Evidence regarding the effect of renal denervation on long-term prognosis, quality of life, or surrogate outcomes such as left ventricular hypertrophy, heart failure, or development of microalbuminuria, is currently still insufficient.

For the time being the use of renal denervation should be reserved for patients with treatment-resistant hypertension only. Other possible indications require additional controlled trials.