Abstract: P260
Effects of sympathetic modulation by renal denervation in patients with heart failure and preserved ejection fraction

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Topic(s):
Chronic Heart Failure - Pathophysiology

Citation:

Background: Heart failure with preserved ejection fraction (HFpEF) is associated with significant morbidity and mortality and up to now no treatment has proven effective. Amongst many pathophysiological derangements studies have indicated that HFpEF might be linked to increased sympathetic activity. Modification of the sympathetic nervous system through renal sympathetic denervation (RDN) is associated with reduction of blood pressure variability, which is an indicator of sympathetic nervous activity and effective circulating volumes. We therefore hypothesised that RDN might pose a possible treatment option in HFpEF through modifying sympathetic activity.

Purpose: The aim of the present analysis was to investigate the effects of RDN on patients with HFpEF.

Methods: Patients =18 years who underwent RDN, either in a prospective randomized clinical trial or in clinical routine in a single high-volume centre, were retrospectively included in the current analysis. Patients with a LVEF < 50% (n=9) were excluded. Patients were stratified into a "HFpEF" or no heart failure "non-HF" group according to ESC recommendations from 2016.

Results: Between November 2011 and September 2018, 76 HFpEF (median age, 66 [IQR 61-74] years, 39.5% ?) and 48 non-HF patients (age 60 [54-66] years, 18.8% ?) were included in the current analysis. RDN reduced systolic ambulatory blood pressure (BP) in both HFpEF (Fig. 1a) and non-HF patients at three-months (-8.5 ± 11.7 and -7.4 ± 10.4, both p<0.001; respectively) and six months (-8.1 ± 11.8 and -8.2 ± 8.4, both p<0.001; respectively). Frequencies of BP response =5 mmHg were not different between HFpEF and non-HF patients (p=0.663).

BP variability (BPV) as indicated by day- or night-time 24-h ambulatory BP standard deviation (SD) tended to be higher in HFpEF as compared to non-HF patients at baseline (SDday 17.0 [13.6-20.2] vs. 14.7 [12.4-17.3], p=0.055 and SDnight 15.5 [12.4-20.4] vs. 12.6 [11.3-15.0], p=0.003). RDN reduced BPV at three and six months in HFpEF patients (Fig. 1b) to equivalent levels of non-HF patients.

Compared to baseline values, NT-proBNP levels at the three months follow-up were decreased in HFpEF (348 [216-679] vs. 326 [164-689] pg/mL, p=0.010) (Fig. 1c) but not in non-HF patients (54 [34-90] vs. 67 [41-114] pg/mL, p=0.006), while renal function as assessed by estimated glomerular filtration rate did not improve in either group.

Conclusion: Sympathetic activity and stressed volume might be increased in HFpEF patients as indicated by higher BPV when compared to non-HF patients undergoing RDN. RDN in HFpEF patients reduced ambulatory BP. Additionally BPV was reduced to values of non-HF patients, which was accompanied by a decrease in NT-proBNP levels. Modification of sympathetic activity through RDN might be a promising therapeutical approach in HFpEF, which merits further investigations.
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