The Effect of Renal Denervation on Blood Pressure in Patients with Resistant Hypertension and Obstructive Sleep Apnea

The results of the Polish Randomised Trial

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Dislosures

- Presenter: Adam Witkowski
- Speaker and proctor fees from Medtronic
Florczak E, Prejblisz A et al. J Hum Hypertens 2013

- 204 patients with true resistant hypertension
- 123 M, 81 F
- Mean age 48 years (range 19-65 years)

72% patients – OSA (AHI ≥ 5 events/h)

45% of patient – moderate / severe OSA

<30% of patients without OSA

27.9

Without OSA

27

Mild OSA

18.6

Moderate OSA

26.5

Severe OSA
Reinforcement of the adrenergic overdrive in the metabolic syndrome complicated by obstructive sleep apnea
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Extra-potentiation of the sympathetic activation when hypertension coexists with metabolic syndrome and obstructive sleep apnea
Three and 6 months after the denervation, significant decreases in office systolic and diastolic BPs were observed.

The reduction in OSA severity was observed in 8 out of 10 patients. There was a trend for attenuated AHI.
Subjects self-reported whether they currently had sleep apnea or OSA and whether they currently used CPAP/BiPAP therapy for nocturnal respiratory support. No confirmatory tests were performed.

Compared with sham control, renal denervation reduced the 6-month office SBP in subjects with OSA but not in subjects without OSA.
Renal Denervation in Patients With Resistant Hypertension and Obstructive Sleep Apnea

**STUDY HYPOTHESIS**

Renal denervation in patients with resistant arterial hypertension and obstructive sleep apnea will have a beneficial effect on blood pressure values and may be related to decrease of the obstructive sleep apnea severity.

**STUDY DESIGN**

Randomized open-label, parallel-groups clinical trial

60 pts (30 vs 30) with OSA (AHI≥15) and RHT (CPAP±)

RDN (*Simplicity catheter, Medtronic*) VS CONSERVATIVE TREATMENT, NO SHAM
Renal Denervation in Patients With Resistant Hypertension and Obstructive Sleep Apnea

Patients with true resistant HT coexisting with moderate-to-severe OSA randomly assigned (n=60)

Patients allocated to the renal denervation group n=30

Patients allocated to the control group n=30

No changes in antihypertensive regimen

3 months follow-up

Patients included n=30

None of pts lost to follow-up

Intensification of antihypertensive regimen in 2 patients

6 months follow-up

Patients included n=28

2 pts lost to follow-up

Intensification of antihypertensive regimen in 3 patients

Patients included n=24

6 pts lost to follow-up

3 months
Difference in SBP changes in the office BP
Difference in SBP and DBP changes in ABPM
Difference in AHI changes

6 months
Difference in SBP changes in the office BP
Difference in SBP and DBP changes in ABPM
Renal Denervation in Patients With Resistant Hypertension and Obstructive Sleep Apnea - reduction in BP levels
Renal Denervation in Patients With Resistant Hypertension and Obstructive Sleep Apnea - reduction in BP levels

**ABPM - 24-hour - reduction at 3 months**

- **Systolic**
  - RDN: -3 mm Hg, *P*<0.001
  - Control: -2 mm Hg, *P*=0.27

- **Diastolic**
  - RDN: -7 mm Hg, *P*<0.001
  - Control: -2 mm Hg, *P*=0.29

*P*=0.037

*P*=0.042
Renal Denervation in Patients With Resistant Hypertension and Obstructive Sleep Apnea - OSA severity

Obstructive sleep apnea severity – reduction in AHI at 3 months

- Change of AHI (events/h)

- RDN
- Control

- P=0.015
- P=0.05
- P=0.52

-8.1
-1.2
Renal Denervation in Patients With Resistant Hypertension and Obstructive Sleep Apnea

- **BP responder** – reduction of office SBP ≥ 10mmHg
- **OSA responder** – reduction in AHI

Among BP responders, in 71% patients reduction in AHI was also observed.
Renal Denervation in Patients With Resistant Hypertension and Obstructive Sleep Apnea

Conclusions:

In keeping with our previous observations, we now showed in a randomized trial that RDN was associated with attenuation of blood pressure and OSA severity.

It may be postulated that patients with resistant hypertension and OSA is a group of patients who may benefit from RDN.