

## Association Between Resistant Hypertension and Obstructive Sleep Apnea

It's alarming to know that hypertension is becoming increasingly prevalent because of our aging population and high incidence of obesity. Two of the leading causes of death and disability are heart disease and stroke. High blood pressure is considered as a major risk factor for both.

When elevations in blood pressure (BP) occur, including high normal BP, it oftentimes progresses to hypertension (HTN). HTN is considered "resistant" when the blood pressure remains above ( $\geq 140/90$  mmHg) in spite of lifestyle modification and the use of three different antihypertensive drugs (including a diuretic) given at full doses, with good compliance with the treatment or as those who require four or more medications for BP control (Sapiña-Beltrán et.al., 2019).

Obstructive sleep apnea (OSA) is the most common form of sleep disordered breathing. It plays an important part in the development of hypertension and is especially associated with the prognosis of resistant hypertension (Oscullo et.al., 2019). The major pathogenic mechanism linking resistant HTN with OSA is sympathetic system activation. During sleep, OSA causes repetitive apneic events (cessation of breathing) resulting in hypoxia (low oxygen) and hypercapnia (high CO<sub>2</sub>), this may lead to an increased chemoreflex drive and bring about high levels of tonic sympathetic excitation and in turn trigger faster heart rate, decreased heart rate variability and increased BP variability (Khan, et.al., 2013). Several studies have shown that severe OSA prevalence was higher among patients with uncontrolled BP. In fact, of all the various secondary causes of resistant HTN, OSA has been identified as the most common disorder associated, accounting for up to 83% of the patients in some studies (Sapiña-Beltrán et.al., 2019).

According to Oscullo et.al., 2019, despite the significant progress made over the years, there are still aspects that we do not know about the treatment of resistant hypertension and a multidimensional treatment may be the best approach.

## Why choose CPAP Pros?

- Professional CPAP Coaching Program™
- Contactless Covid Policy (safe for patients and staff)
- Drop shipping of HSAT devices as well as CPAP equipment\*
- Virtual Telesleepcare
- Professional CPAP Coaches are Registered Sleep Technologists
- We are currently working with the CPSBC to be one of the first accredited sleep care providers in British Columbia
- Level 3 home sleep tests are manually scored by an RPSGT (no auto scoring of studies)
- Great Prices



# CPAP treatment is a part of the multi-faceted approach to relieve resistant hypertension

- **Lifestyle and Diet Changes**

The same recommendations about lifestyle changes given if you have general hypertension can also be applied with resistant hypertension which includes: dietary discretion with sodium, moderation in alcohol consumption, weight loss reduction and regular exercise.

- **Renal Denervation**

Initial studies suggest that catheter-based renal denervation (RDN) might result in additional benefits by lowering your blood pressure and improving the severity of your obstructive sleep apnea.

- **Pharmacological Treatment**

To date, pharmacological therapy comprises the primary approach in the treatment of resistant hypertension and it is important to note that optimal medication adherence is a key in controlling resistant HTN.

- **CPAP Treatment**

Continuous positive airway pressure (CPAP) is an effective treatment of choice for OSA. Several studies have demonstrated that OSA treatment with continuous positive airway pressure (CPAP) reduces BP in patients with hypertension by up to 5 mmHg in those with resistant HTN (Oscullo, et.al., 2019) and in some studies it has been even higher. A decrease of only a few mmHg in BP can significantly reduce cardiovascular risk. All this evidence suggests that OSA and its treatment could be an effective means of controlling resistant HTN. Therefore, it's imperative to screen those people or patients who have drug resistant HTN who have never been screened before for OSA and may have other related symptoms. A referral for a home sleep apnea test (HSAT) can help improve BP control in those with resistant HTN if they test positive for OSA and follow through with CPAP treatment.

CPAP Pros is known for its strong Professional CPAP Coaching Program™ that utilizes highly trained Registered Sleep Technologists (RPSGT) with additional training in coaching to improve the long-term adherence of patients to PAP Therapies.

## References:

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