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Title: Effect of CPAP treatment on blood pressure levels in resistant hypertension. A multicenter randomized study from the Spanish sleep network (NCT00616265)

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Body: Background: Only very few small studies have analyzed the role of CPAP treatment on blood pressure (BP) levels in patients with resistant hypertension (RH) Objective: To evaluate the effect of CPAP treatment on BP levels in patients with RH Methods: Multicenter-randomized study. 210 patients with RH (BP>130/80 mmHg despite 3 antihypertensive drugs) of unknown etiology, confirmed by 24h-ambulatory monitorization [AMPA], and sleep apnea (AHI>15) were randomized to usual control plus CPAP (n=105) or only usual control (n=105) both for three months. Variables derived from AMPA including daytime and night-time BP values and nocturnal patterns were compared intra- and inter- randomized groups. Good adherence to CPAP was considered as ≥ 4 hours/day. Results: Mean age 57.9 (68% males). Mean AHI 40.4. 24h-mean systolic /diastolic blood pressure (SBP/DBP):143/82.5 mmHg. 75% with non-dipper pattern. Patients with good adherence to CPAP (mean use: 5.9 h/d) have a net decrease of -5.5 mmHg in SBP ($p<0.001$) and -4.2 mmHg in DBP ($p<0.001$), especially in nocturnal SBP (-7.5 mmHg; $p<0.001$). There is a positive correlation between the increase used of CPAP in hours/d and the decrease in BP levels ($r=0.25$; $p=0.014$). 28% of patients in CPAP group vs 17.5% in control group normalized their BP levels; $p=0.045$).

More patients in CPAP group significantly recovered their dipper pattern, compared with control group ($p=0.008$) Conclusions: CPAP treatment significantly decrease SBP and DBP levels and allowed the recovering of normal dipper pattern in patients with RH and sleep apnea. The magnitude of these effects correlate with the number of hours of CPAP use.