Clinical Effects of Continuous Positive Airway Pressure in Patients With Obstructive Sleep Apnea And Non-dipping Blood Pressure

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Objective: to investigate the effects of 6 months of continuous positive airway pressure (CPAP) treatment on blood pressure (BP) and urine albumin/creatinine ratio (ACR) in obstructive sleep apnea (OSA) patients with nondipping patterns.

Methods: We prospectively enrolled adult patients with severe OSA (AHI>30) from November 2010 to December 2015 for ambulatory 24-hr BP study. Baseline 24hr BP was recorded, urine was collected for ACR and peripheral venous blood samples were collected for the analysis of CBC-DC, creatinine, lipid profile, and high sensitivity CRP (hsCRP). After CPAP use, we measured 24-hr BP, hsCRP and ACR at 3 and 6 months separately. Statistical analyses (paired T test, generalized estimating equation) were performed by SAS.

Results: A total of 77 patients were enrolled. At baseline, 42(54.5%) of patients were dippers (a decrease of at least 10% in the average nighttime blood pressure compared with the average daytime blood pressure) and 35(45.5%) were non-dippers. In non-dippers, the mean AHI was 70.0 (SD, 22.7), baseline 24-hr mean BP was 125.0(SD, 17.1) mmHg (systolic blood pressure (SBP): 140.1(SD, 19.7) mmHg, diastolic blood pressure (DBP): 95.0(SD, 13.8)mmHg).CPAP treatment decreased SBP by 1.59 mmHg (95% confidence interval (CI):-9.2 to 3.6; P=0.287), and diastolic blood pressure by 3.13 mmHg (95%CI:-7.5 to 0.7; P=0.062). After 6 months of CPAP treatment, 20(57.1%) of non-dippers displayed dipping BP pattern and 15(42.9%) were refractory non-dippers (average day-night BP decrease 14.3±3.6%, 3.0±5.1% ; P<0.001). Non-dippers had reduction in ACR (-14.0±42.7 mg/L) (p=0.061) and those who displayed dipping pattern after CPAP had the most significant reduction in ACR (-7.0±10.25 mg/L) (p=0.010). HsCRP level decreased significantly in non-dippers who had dipping pattern after CPAP (-1.13±3.73 mg/L) when compared with refractory non-dippers (3.05±6.08 mg/L) (p=0.024).

Conclusion: In severe OSA patients with nondipping BP, CPAP treatment for 6 months decreased ACR, especially in those who displayed dipper pattern after CPAP. This effect of non-dippers converting to dippers was associated with greater decrease in hsCRP.

中文題目：陽壓呼吸器在阻塞性睡眠呼吸中止症併夜間血壓高病患的臨床效果分析

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