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CARDIAC FUNCTION AND HEART FAILURE

CLINICAL IMPORTANCE AND INTERDEPENDENCE OF PERIODIC BREATHING DURING ASLEEP AND EXERCISE IN PATIENTS WITH HEART FAILURE

ACC Poster Contributions

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Background: Central sleep apnea (CSA) and exercise oscillatory ventilation (EOV) might be both originated from an instability in feedback peripheral and central chemoreflex control of ventilation. However, it is unknown the relation between CSA and EOV in patients with heart failure (HF).

Methods: In 27 patients with moderate to severe CSA determined by cardiorespiratory polygraphy (apnea/hypopnea index $34 \pm 11/h$, central apnea index $22 \pm 10/h$), cardiopulmonary exercise test was performed. EOV was defined as 3 or more regular oscillatory fluctuations in ventilation.

Results: EOV was observed in 70% of patients (mean cycle length of EOV: 81 ± 26 sec). Notably, the cycle length of EOV was similar to that of CSA ($R=0.89$, $p<0.001$, Figure). The patients with EOV had lower rest end-tidal carbon dioxide (ETCO₂) level (4.4 ± 0.6 vs. $5.2 \pm 0.6\%$, $p<0.001$), lower peak oxygen uptake (628 ± 172 vs. 1087 ± 382 ml/min, $p<0.05$) and longer cycle length of CSA (80 ± 25 vs. 61 ± 11 sec, $p<0.05$), compared to the patients without EOV. In patients with cycle length of CSA ≥ 78 sec, 100% of patients had EOV. In patients with cycle length of CSA < 78 sec, however; 61% of patients had EOV. Multivariate analyses revealed that ETCO₂ level was the strongest independent predictor of EOV.

Conclusion: Presence of EOV is determined by resting pCO₂ level and cycle length of CSA in HF patients with CSA.

Cycle length of CSA and EOV

