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Title: Acute hemodynamic effects of a therapy with adaptive servoventilation in patients with heart failure compared to healthy volunteers

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Body: Purpose: Adaptive Servoventilation (ASV) allows for effective treatment of nocturnal Cheyne-Stokes respiration in heart failure (HF) patients, but acute hemodynamic effects of such therapy remain unknown. Methods: HF patients (EF ≤ 50%, NYHA ≥ II) and CSR (apnea-hypopnea-index, AHI ≥ 15/h) were ventilated using ASV (PaceWace™, ResMed) for 1h at their individual therapeutic pressure level (mean expiratory pressure: 8 ± 2 cmH₂O; mean inspiratory pressure support: 15 ± 2 cmH₂O). Hemodynamic effects were analyzed non-invasively (Task Force Monitor, CNSystems) and compared to those 30 minutes before and after ventilation and with results obtained in 15 healthy volunteers. Echocardiography was performed to assess mitral and tricuspid annular plane systolic excursion (MAPSE, TAPSE). Results: A total of 27 patients (26 male, 70 ± 11 years, EF 37 ± 8%) and 15 healthy volunteers were included. The table summarizes hemodynamic response and demonstrates a decrease in HF in all, a trend towards an increase in stroke volume (SV) in HF patients and a decrease in healthy volunteers. In addition diastolic BP increased in both groups. Further analysis revealed that response in SV was dependent on right and left ventricular function.

Patients	HR (bpm)	BP (mmHg)	SV (ml)
Before ASV	68±11	110±14 / 67±11*	61±9
On ASV	66±11*	112±13* / 70±9*	62±10*
After ASV	68±10*	117±14* / 71 ±11	59±9*
Volunteers			
Before ASV	63±7	128±12* / 76±9*	99±21
On ASV	61±6*	134±14* / 82±9*	95±18

After ASV	67±8*	136±15 / 82±10	94±20
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Conclusion: Acute hemodynamic effects of ASV seem to be different in HF patients and healthy volunteers and might be dependent on ventricular filling pressures.