

LETTERS TO THE EDITOR

ASV in CHF Recommendations Too Restrictive

Reply to Aurora et al. Updated adaptive servo-ventilation recommendations for the 2012 AASM guideline: "The Treatment of Central Sleep Apnea Syndromes in Adults: Practice Parameters with an Evidence-Based Literature Review and Meta-Analyses". *J Clin Sleep Med* 2016;12(5):757–761.

Karin G. Johnson, MD; Douglas C. Johnson, MD

Baystate Medical Center, Springfield, MA

We have concerns with the updated adaptive servo-ventilation (ASV) recommendations¹ against the use of ASV to treat moderate-severe central sleep apnea (CSA) in congestive heart failure (CHF) patients with LVEF \leq 45%. The updated recommendation is based exclusively on the SERVE-HF study,² which reported increased cardiovascular and mortality risk in CHF patients with LVEF \leq 45%. However, that study found no difference in primary endpoint or cardiovascular mortality among those with LVEF \geq 30%, and that ASV lowered risk in patients with LVEF \leq 45% and Cheyne Stokes respiration (CSR) $<$ 20% of recording time.

Despite being a large randomized controlled trial, critical limitations should be considered given many other studies with ASV in CHF which show improved oxygenation and measures of cardiac function. Study flaws include protocol violations with LVEF 10–54% in the ASV arm and 9–71% in the control arm. There was missing LVEF data in 130 patients in ASV arm and 126 patients in control arm. A total of 251/666 patients dropped out of the ASV arm, and 87/659 control patients used ASV.

Adequate titration was not achieved in an unknown number of patients, with mean residual AHI at 36 months of 7 (range 0–61) and mean SpO₂ $<$ 90% of 19 minutes (range 0–291). It is possible the increase in mortality was in those patients having poor control of hypoxia and/or AHI. It is possible control patients had more aggressive CHF treatment to control sleep symptoms. More ASV patients were on antiarrhythmics at baseline, which may have affected endpoints. CAN-PAP trial³ sub-analysis showed that CHF patients with optimal response to CPAP had improved outcomes. It is possible there might be a similar case with ASV.

Sixty percent of residual events were obstructive. If EPAP level is inappropriately titrated, ASV rapidly increases pressure support in response to residual obstructive events often resulting in pressure cycling. Once the airway opens, high pressure may cause overventilation exacerbating instability. Residual events and low oxygen levels may harm the patient. Newer ASV algorithms allow for automatic EPAP adjustment to obstructive events and a quicker drop in PS to as low as 0, which may limit these effects.

There is an ongoing multicenter cohort study (FACE) of ASV in CHF patients finding no difference in adverse events at

their interim analysis.⁴ Future studies should allow a titration period to achieve optimal settings prior to randomization.

ResMed ASV helps stabilize CSR by adjusting inspiratory pressure to achieve a goal ventilation based on recent ventilation weighted toward the last 3 minutes.⁵ ASV benefits patients without CHF with OSA and treatment emergent CSA or baseline CSR and CHF patients with LVEF \leq 45% with treatment-emergent CSA. Until we have more data, warnings against ASV should be changed to ASV may be considered with caution and close monitoring for patients who have LVEF $<$ 30% and CSR $>$ 20% of the time. Close follow-up and monitoring should be done in all patients with ASV to ensure stable cardiac status and AHI $<$ 5 and oxygen saturations above 90%.

CITATION

Johnson KG, Johnson DC. ASV in CHF recommendations too restrictive. *J Clin Sleep Med* 2016;12(9):1313–1314.

REFERENCES

1. Aurora RN, Bista SR, Casey KR, et al. Updated adaptive servo-ventilation recommendations for the 2012 AASM Guideline: "The Treatment of Central Sleep Apnea Syndromes in Adults: Practice Parameters with an Evidence-Based Literature Review and Meta-Analyses". *J Clin Sleep Med* 2016;12:757–61.
2. Cowie MR, Woehrle H, Wegscheider K, et al. Adaptive servo-ventilation for central sleep apnea in systolic heart failure. *N Engl J Med* 2015;373:1095–105.
3. Bradley TD, Logan AG, Kimoff RJ, et al. Continuous positive airway pressure for central sleep apnea and heart failure. *N Engl J Med* 2005;353:2025–33.
4. Tamisier R, Damy, T, Davy, J et al. Morbidity and mortality of chronic heart failure (CHF) patients treated by adaptive servoventilation (ASV): interim data of the FACE Multicentre National Cohort Study. Abstract 6864. American Thoracic Society International Conference. San Francisco, 2016.
5. Johnson KG, Johnson DC. Treatment of sleep-disordered breathing with positive airway pressure devices: technology update. *Med Devices (Auckl)* 2015;8:425–37.

SUBMISSION & CORRESPONDENCE INFORMATION

Submitted for publication July, 2016
Accepted for publication July, 2016

Address correspondence to: Karin Johnson, Baystate Medical Center
Neurodiagnostics and Sleep Center, 759 Chestnut St Springfield, MA 01199; Tel:
(413) 794-5600; Fax: (413) 794-7297; Email: Karin.johnson@bhs.org

DISCLOSURE STATEMENT

The authors have indicated no financial conflicts of interest.