Heterogeneity of Response to Constant Positive Pressure in Patients With Heart Failure and Coexisting Central and Obstructive Sleep Apnea

Why?

To the Editor:

The ventilatory treatment of patients with heart failure (HF) associated with obstructive sleep apnea (OSA), central sleep apnea (CSA), and Cheyne-Stokes respiration (CSR) remains debated. In a recent study in CHEST (August 2012), Randerath and colleagues compared the efficiency of auto-servoventilation (ASV) and CPAP in these patients. They report that ASV is superior to CPAP in improving CSA/CSR and N-terminal pro brain natriuretic peptide levels. As in previously published studies, they observed a heterogeneity of response to CPAP on central and periodic apnea-hypopnea indices. In our opinion, at least two hypotheses may explain this heterogeneity of response and need to be evaluated in future studies.

First, the level of pressure in the CPAP group may have influenced the results on an “individual basis,” although there is no statistical difference in the level of end-expiratory pressure between the CPAP group and the ASV group (mean CPAP, 10.3 ± 1.0 cm H2O; mean expiratory positive airway pressure in ASV group, 8.4 ± 1.7 cm H2O). As shown previously, there is a heterogeneous effect of CPAP on cardiac output, depending on the patient and the level of pressure. A negative hemodynamic impact of CPAP on the heart could aggravate the vicious cycle of HF-CSA/CSR. Considering the high levels of N-terminal pro brain natriuretic peptide in the patients treated with CPAP reported by Randerath and colleagues, it would be interesting to evaluate on an “individual basis” the impact of CPAP on heart hemodynamics and correlate this result with the residual central and periodic apnea-hypopnea indices.

Second, the distribution of the central events during the night may also have influenced the results. Two types of patients can be observed in the situation of coexisting OSA/CSA/CSR and HF. Some patients have central events throughout the night, whereas some have central events only at the end of the night. These latter patients have a better response to CPAP; central events at that time are the consequence of transient cardiac dysfunction induced by the obstructive events of the beginning of the night. Correction of the obstructive events avoids cardiac dysfunction and central events induced. In our experience, the need to change CPAP to ASV because of the persistence of central events is unusual in this subtype of patients, whereas it is common if the central events are distributed throughout the night. In conclusion, future studies will determine the predictive factors of failure or success of CPAP in patients with HF and coexisting OSA/CSR.

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