Sleep disordered breathing, neurocognitive impairment and diastolic function in acute heart failure patients with preserved ejection fraction

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Background: Sleep disordered breathing (SDB) and neurocognitive impairment (NI) are typical features of heart failure (HF), especially HF with preserved ejection fraction (HFrEF).

Purpose: To investigate changes in the severity of SDB, the degree of NI, and the diastolic function in an acute phase of hospitalization and in a stable period at home after discharge.

Methods: We enrolled 24 AHF patients (12 HFrEF and 12 HFrEF) with SDB and compared them to a matched population of 12 non-HF patients hospitalized for other cardiovascular causes. A complete echocardiogram, a set of NI tests, and a polysomnography were performed in the acute phase and after 3 months follow-up.

Results: Improvements in diastolic and right ventricular function were observed at 3 months compared to baseline, with a greater extent in HFrEF vs HFrEF, probably due to the higher volume load dependence of these echocardiographic indexes in HFrEF than HFrEF: respectively E/E' from 15.52 ± 6.90 to 13.28 ± 5.67 in HFrEF (p < 0.05) and 12.57 ± 4.49 to vs 13.56 ± 5.57 in HFrEF (p= 0.2); LAVI- left atrial volume index-from 63.49 ± 41.94 ml/m2 to 54.08 ± 34.20 ml/m2 (p = 0.04) vs 55.59 ± 17.01 ml/m2 to 54.60 ± 24.55 ml/m2 (p 0.2); PAPs -pulmonary artery pressures-from 34.57 ± 7.73 mmHg to 25.02 ± 14.94 mmHg (p = 0.04) vs 31.65 ± 10.99 mmHg to 25.36 ± 10.25 mmHg (p 0.02); TAPSE –tricuspid annular plane systolic excursion- from 20.57 ± 4.40 mm to 25.14 ± 10.14 mm (p = 0.03) vs 16.90 ± 3.21 mm to 21.70 ± 6.15 mm (p 0.03). At baseline SDB were present in both HFrEF and HFrEF, and a significant reduction of apneic events was observed at follow up (AHI-apnea hypopnea index-: 25.0 ± 16.9/h to 16.6 ± 10.7/ h and 33.7 ± 21.6/ h to 19.2 ± 14.1/h, p < 0.05; mean SaO2 –oxygen saturation–: 91.7 ± 4.4 % to 92.8 ± 2.1% vs 91.6 ± 2.4% vs 92.8 ± 2.3%, p = NS). Moreover, compared to non HF and HFrEF patients, lower baseline scores at NI tests were observed in HFrEF, but a more significant improvement was assessed at 3 months in this group.

Conclusion: Our study seems to suggest that in AHF patients with SDB the achievement of a better compensation could lead to important beneficial effects not only on echocardiographic parameters and nocturnal respiratory profile, but also on NI, especially in HFrEF.