THE IMPACT OF ADAPTIVE SERVO-VENTILATOR ON CORONARY FLOW VELOCITY RESERVE IN PATIENTS WITH NON-ISCHEMIC DILATED CARDIOMYOPATHY

Poster Contributions
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Background: Sleep apnea syndrome (SAS) is the most common comorbidity in patients with chronic heart failure (CHF). Adaptive servo-ventilation (ASV) is a ventilatory support system designed to normalize ventilation in CHF with SAS. ASV improves left ventricular function and heart failure condition. However, the effects of ASV on coronary flow velocity reserve (CFVR) are still unclear. The objective of this study was to elucidate the acute effect of ASV on CFVR and cardiac function in patients with non-ischemic dilated cardiomyopathy (NICM).

Methods: We enrolled 22 patients with NICM (NYHA functional class III or IV; mean age 57±15 years, 16 males). Measurements of conventional echocardiographic parameters and CFVR were acquired twice (at baseline and 20 minutes after ASV therapy) using the GE Vivid 7 equipment. CFVR in the left anterior descending coronary artery was defined as the ratio of hyperemic to resting averaged diastolic peak velocity by an infusion of adenosine triphosphate (0.14mg/kg/min).

Results: Baseline mean left ventricular ejection fraction (LVEF), LV end-diastolic volume (LVEDV) and LV end-systolic volume (LVESV) were 29.2 ± 11.5%, 161 ± 53 ml and 117 ± 47 ml, respectively. LVEDV (161 ± 53 ml vs. 153 ± 55 ml, p < 0.01) and LVESV (117 ± 47 ml vs. 106 ± 48 ml, p < 0.01) were significantly decreased on ASV therapy. LVEF (29.2 ± 11.4% vs. 33.2 ± 11.3%, p < 0.05) and e' (-4.3 ± 1.7 cm/s vs. -4.8 ± 1.6 cm/s, p < 0.05) were also significantly improved on ASV therapy. Furthermore, tricuspid annular plane systolic excursion (TAPSE), which was a surrogate of right ventricular systolic function, was significantly improved on ASV therapy (13.5 ± 4.6 mm vs. 16.3 ± 4.8 mm, P < 0.001). In addition, CFVR on ASV therapy was significantly increased compared with that before ASV (1.92 ± 0.67 vs. 2.65 ± 1.13, P < 0.001). However, in 4 patients with restrictive diastolic physiology (basal transmitral E velocity / A velocity ratio > 2.0), the effect of ASV on CFVR was limited.

Conclusion: Adaptive servo-ventilator has a potential to improve coronary microcirculatory function and global biventricular function in patients with DCM except those having restrictive diastolic physiology.