Background: Adaptive servo-ventilation (ASV) can eliminate Cheyne-Stokes respiration in heart failure (HF) patients. Recently, we showed that ASV reduced muscle sympathetic nerve activity (MSNA) and the sympathoinhibitory effect was closely correlated with the changes of respiratory instability during ASV. However, it is still unknown whether the effect is sustained after removed ASV.

Methods: Twenty symptomatic HF patients were enrolled. MSNA, heart rate, blood pressure, respiration and oxygen saturation level were monitored continuously before (10min), during (30min) and after (10min) application of ASV. Respiratory instability was determined by coefficient of variation of tidal volume (CV-TV).

Results: Heart rate and blood pressure were unchanged during and after ASV. Respiratory rate were decreased and oxygen saturation level were increased significantly during ASV, but recovered after ASV. In contrast, CV-TV was decreased significantly during and even after ASV (p<0.001, p<0.05, vs before ASV, respectively). Similarly, MSNA was decreased during and after ASV (p<0.001, p<0.05, vs before ASV, respectively). The change of MSNA (before-during) was correlated with the change of CV-TV (before-during) (R=0.52, p<0.05), but not with the changes of other parameters (before-during). Importantly, the change of MSNA (before-after) was also correlated with the change of CV-TV (before-during) (R=0.53, p<0.05), but not with that of CV-TV (before-after).

Conclusions: These findings suggest that respiratory stabilization might induce sympathetic inhibition both during and after application of ASV.