**Effect of Single Bout of Lower Extremity Training on Autonomic Nervous System for Heart Failure Patients**

Naoki SASANUMA, PT, Shinya YAMAUCHI, PT, Yusuke ITANI, PT, Takashi TANAKA, PT, Satoshi MABUCHI, PT  
*Department of Rehabilitation, Hyogo College of Medicine Hospital*

Hideyuki SHIOTANI, MD  
*Department of Preventive Medicine, Graduate School of Health Sciences, Kobe University*

Keiko TAKAHASHI, MD, Mitumasa OHYANAGI, MD  
*Department of Circulatory Medicine, Hyogo College of Medicine*

Norihiko KODAMA, MD, Kazuhisa DOMEN, MD  
*Department of Rehabilitation Medicine, Hyogo College of Medicine*

**Objective:** Lower extremity training (LET) was implemented in patients with cardiac failure (CF) during an early stable phase to investigate differences in cardiovascular response, symptomatic response, and severity according to cardiovascular indices. These were investigated using cardiac autonomic nerve activity.

**Methods:** The study was included 20 patients with CF. After 5 minutes of LET, we measured changes in heart rate (HR), blood pressure (SBP), heart rate variability [low frequency (LF), high frequency (HF), and LF/HF], and rating of perceived exertion (RPE). The objects were classified in slight illness group and the severe ill group, and the comparison between groups was carried out.

**Results:** In all patients, HR and RPE significantly increased after LET, and these effect were observed for up to 20 min after completion of LET. The decrease in HF was also maintained for 20 min after completion of RT. Comparison of the mild and severe CF groups revealed that HF significantly declined due to LET, and the decline was maintained for 40 min after completion of LET in the severe CF group. Evidence of significant decline in the mild CF group disappeared 10 min after completion of LET. Recovery was observed in RPE immediately after completion of LET in the mild CF group.

**Conclusion:** In our study, parasympathetic nerve activity was reduced by LET its RPE was around 3 until 20 min after exercise in all patients. The severe CF group demonstrated strong RPE and decreases in both parasympathetic nerve activity and heart rate response. The mild CF group demonstrated prompt responses in parasympathetic nerve activity.