Abstract Type : Poster
Presentation No. : PNO 008

Clinical Significance of Heart Rate Variability for the monitoring of cardiac autonomic function in End-Stage Renal Disease Patients

Ji-Yeun Chang1, Eun Jeong Ko1, Hoon Suk Park2, HyungWook Kim1, Dong Chan Jin2, Jae Hyoung Cho3, Chul Woo Yang1, Byung Ha Chung1
1Department of Internal Medicine-Nephrology, The Catholic University of Korea, Seoul St. Mary’s Hospital, Korea, Republic of
2Department of Internal Medicine-Nephrology, The Catholic University of Korea, St. Vincent’s Hospital, Korea, Republic of
3Department of Internal Medicine-Endocrine, The Catholic University of Korea, Seoul St. Mary’s Hospital, Korea, Republic of

Objectives: Cardiac autonomic dysfunction is a major cause of death in end-stage renal disease (ESRD). However, suitable parameters to monitor real-time cardiac autonomic function have not been investigated. We aimed to determine whether heart rate variability (HRV) is related with the cardiac autonomic dysfunction and heart failure in ESRD patients.

Methods: This cross-sectional study was performed in Seoul St. Mary’s hospital between Jun 2017 and Feb 2017. Seventy-seven ESRD patients, who admitted for kidney transplant work up, and twenty-nine healthy controls (HCs) were asked to wear the continuous ambulatory HRV monitor (T-REX®; Taewoong Medical, Gyeonggi do, Korea) for 24 hours. HRV measures included both time domain methods (24SDNN, 24SDANN, RMSSD) and frequency domain methods (LF, HF, LF/HF ratio, Total power). Decrease in HRV means impairment of cardiac autonomic function. General cardiac function was evaluated using transthoracic echocardiogram. We compared HRV parameters between ESRD patients and HCs, and also investigated which factors affected the parameters in ESRD patients.

Results: All HRV parameters measured by both time domain and frequency domain methods were significantly decreased in ESRD patients compared to HCs (p<0.001). In ESRD patients, the patients having residual kidney function showed numerically higher tendency in HRV parameters than the patients receiving renal replacement therapy. In correlation analysis between echocardiogram parameters and HRV parameters, 24SDNN, 24DANN and LF/HF ratio showed negative correlation with E/e’ and LAVI which are representative parameters for diastolic function of heart (p<0.05). And more severe diastolic dysfunction was related with more lower value of 24SDANN and LF/HF ratio (24SDANN, Gr0=78.8, Gr1=75.0, Gr2=63.7, p=0.037; LF/HF ratio, Gr0=6.5, Gr1=5.5, Gr2=3.8, p=0.037).

Conclusions: In ESRD patients, cardiac autonomic function measured using HRV were markedly reduced ant it showed significant association with diastolic heart dysfunction.