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The Correlation of Parathyroid Hormone and Heart Rate Variability in CAPD Patients

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Abstract

Objective: To investigate the correlation of parathyroid hormone (PTH) and cardiac autonomic nervous system (ANS) measured by heart rate variability (HRV) method in continuous ambulatory peritoneal dialysis (CAPD) patients.

Material and Method: Healthy subjects (HS) and two groups of CAPD patients classified by the PTH concentration: high PTH group (H-PTH; PTH = 150-300 pg/ml) and ultra-high PTH group (UH-PTH; PTH >300 pg/ml) were studied. Time and frequency domains of HRV were analyzed. For the frequency domain, the fast Fourier transform of the total power (TP), low frequency (LF), high frequency (HF), and LF/HF ratio were transformed by natural logarithm (ln). The Pearson's correlation was used to analyze the correlation between lnPTH and the parameters of HRV.

Results: Time and frequency domains of HS were at highest values whilst LF/HF ratio was the lowest. For UH-PTH CAPD patients, the values of standard deviation of R-R interval (SDNN), root mean square of the difference of R-R interval (RMSSD), lnTP and lnHF were significantly lower whereas lnLF was not significantly different compared to H-PTH. In addition, lnHF was found to have the highest negative correlation value with lnPTH concentration ($r = -0.53$).

Conclusion: PTH, a serious uremic toxin, influences the initiation of ANS dysfunction. According to decreased lnHF, a decrease in parasympathetic activity was demonstrated in UH-PTH. Consequently, the modality that can stimulate the parasympathetic activity should be considered in CAPD patients who were hyperparathyroidism.

Keywords: Heart rate variability, Parathyroid hormone, CAPD

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