

Diabetic cardiac autonomic dysfunction: parasympathetic versus sympathetic

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Background: Diabetic cardiac autonomic dysfunction often causes lethal arrhythmia and sudden cardiac death. ^{123}I -Metaiodobenzylguanidine (MIBG) can evaluate cardiac sympathetic dysfunction, and analysis of heart rate variability (HRV) can reflect cardiac parasympathetic activity. We examined whether cardiac parasympathetic dysfunction assessed by HRV may correlate with sympathetic dysfunction assessed by MIBG in diabetic patients.

Methods and Results: In 24-hour electrocardiography, we analyzed 4 HRV parameters: high-frequency power (HF), HF in the early morning (EMHF), rMSSD and pNN50. MIBG planar images and SPECT were obtained 15 minutes (early) and 150 minutes (late) after injection and the heart washout rate was calculated. The defect score in 9 left ventricular regions was scored on a 4 point scale (0 = normal ~ 3 = severe defect). In 20 selected diabetic patients without congestive heart failure, coronary artery disease and renal failure, parasympathetic HRV parameters had a negative correlation with the sum of defect scores (DS) in the late images ($R = -0.47 \sim -0.59$, $p < 0.05$) and some parameters had a negative correlation with the washout rate ($R = -0.50 \sim -0.55$, $p < 0.05$). In a total of 64 diabetic patients also, these parameters had a negative correlation with late DS ($R = -0.28 \sim -0.35$, $p < 0.05$) and early DS ($R = -0.27 \sim -0.32$, $p < 0.05$).

Conclusions: The progress of diabetic cardiac parasympathetic dysfunction may parallel the sympathetic one.

Key words: diabetic mellitus, autonomic nervous system, metaiodobenzylguanidine, heart rate variability