

Summary

The Mechanism of Neurally Mediated Syncope Assessed by an Ambulatory Radionuclide Monitoring System and Heart Rate Variability Indices during Head-Up Tilt

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[Purpose] Previously, we tested the hypothesis that the great decline in left ventricular volume during head-up tilt test could trigger ventricular mechanoreceptor activation, using ambulatory radionuclide monitoring system (C-VEST system). The aim of this study is to investigate the mechanism of tilt-induced syncope further, based on our previous report.

[Method] We measured the temporal changes in left ventricular volume, ejection fraction, cardiac output, and heart rate variability indices during head-up tilt test in 34 patients with syncope of an undetermined etiology. **[Result]** Twenty-two patients had a positive response (P group). Twelve patients showed a negative response (N group). Before syncope, left ventricular volume declined (P group, diastolic volume; $-7.9 \pm 6.8\%$: systolic volume; $-23.3 \pm 33.8\%$: N group, diastolic volume; $-2.5 \pm 1.9\%$: systolic volume; $0.6 \pm 9.5\%$: $p < 0.05$), ejection fraction increased (P

group, $3.9 \pm 2.5\%$; N group, $-3.5 \pm 7.2\%$; $p < 0.005$), and high frequency spectra increased (P group, $12.0 \pm 20.3\%$; N group, $3.1 \pm 9.7\%$; $p < 0.05$), more extremely in the P group than in the N group. The value of the high frequency spectra before the head-up tilt test was significantly higher in the P group than in the N group (P group, 5.8 ± 0.9 ms; N group, 5.0 ± 1.1 ms; $p < 0.05$). **[Conclusions]** (1) The precise evaluation of left ventricular volume by ambulatory radionuclide monitoring system combined with a heart rate variability analysis is considered to be useful for clarifying the pathophysiology of neurally mediated syncope. (2) Patients with neurally mediated syncope have higher baseline parasympathetic tone than normal population.

Key words: Head-up tilt test, Syncope, Ambulatory radionuclide monitoring, Heart rate variability.