Modifications of Autonomic Activity and Baroreceptor Response During Tilt-induced Vasovagal Syncope

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Vasovagal syncope (VVS) is diagnosed by medical history and confirmed by head-up tilt (HUT) test. The acceptable pathophyisiological mechanism for VVS is the simultaneous induction of the enhancement of vagal activity and the withdrawal of sympathetic activity. But the recent studies discover the parasympathetic activity could be inhibited during VVS. Therefore, in this study we attempted to examine this controversial by heart rate variability and baroreceptor sensitivity. Twenty positive HUT patients and twenty negative HUT patients were enrolled in this study from 2005 to 2009 in Taiwan. The baseline hemodynamic data of patients were checked with impedance cardiography. The spontaneous activity of the baroreceptor was determined by using the sequence method, rising sequences (rising systolic blood pressure, prolonged RR-interval) and falling sequences (falling systolic blood pressure, shorter RR-interval). Frequency domain analysis of heart rate variability was performed for assessment of autonomic activities. The results showed the VVS subjects had lower total peripheral vascular resistance in baseline. During HUT test the VVS subjects had increased LF/HF (7.585 ± 6.20 vs. 3.45 ± 1.21, $P=0.0083$) and decreased baroreceptor sensitivity (7.986 ± 2.34 vs. 11.88 ± 3.34 ms/mmHg, $P<0.001$). In conclusion, patients with VVS have the characteristics of baseline vascular sympathetic dysfunction and postural cardiac hypersympathetic activity. The decreased baroreceptor sensitivity revealed that the VVS subjects could not respond the sufficient heart rate to compensate blood pressure because of baroreflex impairment.