

Electrophysiology

Evaluation of the Behavior of the Time Interval from the Onset of the QRS Complex to the Onset of Radial and Carotid Pulse Waves with the Result of the Tilt Test

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Background

The tilt test (TT) is a diagnostic tool used to evaluate autonomic function in patients with syncope. However, as TT has a high rate of false positive results and the duration of the test is long, new strategies are emerging. A device developed in Argentina allowed establishing a non-invasive, reproducible and reliable method to measure pulse wave velocity in the carotid and radial arteries during a conventional TT and to determine its likelihood to predict the result of the test.

Objective

To assess the usefulness of time delay of the pulse waveform from the onset of the QRS complex in order to predict the result of the tilt test.

Material and Methods

We conducted an observational study on consecutive patients with syncope referred to the tilt test laboratory. During the test blood pressure, heart rate and carotid and radial pulse waves were recorded simultaneously with a specially designed polygraph. Univariate and multivariate analyses were performed to assess the ability of time delay of the pulse waveform from the onset of the QRS complex to predict the result of the TT. This ability was evaluated with the analysis of ROC curves.

Results

A total of 43 patients were included; 24 (55.8%) were women. The TT was positive in 18 patients (11 women). Univariate analysis determined that changes in systolic blood pressure ($p=0.02$) and diastolic blood pressure ($p<0.01$) measured at 10 minutes, the use of ACEI/ARB ($p=0.01$) and time delay of the carotid pulse wave ($p<0.01$) were related to the result of the TT. At multivariate analysis, only time delay of the carotid pulse wave was a significant predictor of the result ($p=0.036$). The C statistic of the time delay of the carotid pulse wave was 0.88 (95% CI 0.76 to 0.99).

Conclusions

Measurement of the time delay of the carotid pulse wave at 5 minutes is an independent predictor of the result of the TT, allowing a correct classification in 88% of patients before the development of symptoms.