

Self-Monitoring of Cardiac Autonomic Function at Home Is Feasible

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Abstract

Background:

Cardiovascular autonomic neuropathy (CAN) is associated with diabetes and may be related to the development of hypertension, ischemic stroke, and a number of other late complications. The earliest sign of CAN is a reduction of heart rate variability (HRV). Standard HRV tests for CAN include expiration-to-inspiration ratio, response to active standing (30:15), and the Valsalva maneuver. Because of the technical requirements for these tests, they are limited to the point-of-care office or a clinical laboratory setting. It is unknown if a “white-coat” phenomenon exists in autonomic neuropathy testing and if home testing is feasible. The aims of this study were (1) to evaluate the reproducibility of CAN testing in a clinical setting, (2) to evaluate the feasibility of self-monitoring of cardiovascular autonomic function at home, and (3) report possible differences in measurements taken at the hospital versus those taken at home.

Method:

Ten healthy subjects were included. Participants underwent in-hospital testing for CAN before and after home monitoring. For 6 consecutive days, participants measured autonomic function once a day at home. The intra- and interindividual reproducibility was determined by coefficient of variation (CV) and the reproducibility coefficient (RC). Agreement between hospital and home testing was analyzed using Pearson r , mean difference, and Bland–Altman analysis with Pitman’s test of difference in variance.

Results:

Pitman’s test showed no significant difference in variance between hospital and home measurements, indicating suitable agreement between the two measurements. Reproducibility was moderate to high in all measures, with RC ranging from 66–94% and CV ranging from 5–10%.

Conclusions:

Home testing of CAN is feasible. The evaluations showed no significant systematic error of in-hospital testing compared with self-monitoring at home. In this study, we were not able to demonstrate the presence of “white coat” effect in standard cardiovascular reflex tests.

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Abbreviations: (CAN) cardiovascular autonomic neuropathy, (CV) coefficient of variation, (E:I) expiration-to-inspiration ratio, (ECG) electrocardiogram, (HRV) heart rate variability, (RC) reproducibility coefficient, (SD) standard deviation

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