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Bayesian estimation of cardiovascular autonomic neuropathy diagnostic test based on short-term heart rate variability without a gold standard

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Objective: This study aimed to evaluate the reference values for the short-term heart rate variable (HRV), estimate the performance of cardiovascular autonomic neuropathy (CAN) diagnostic tests in the absence of a gold standard, and assess CAN prevalence in our cross-sectional dataset.

Methods: Of 2,092 subjects available for data analysis, 371 healthy subjects were selected to reference the values for the short-term HRV. An external data set contained 88 subjects who completed both the short-term HRV test and Ewing's test. Simultaneous inferences about the population prevalence and the performance of each diagnostic test were possible using the Bayesian approach.

Results: The cutoff points of 356.13 ms2, 55.45 ms2 and 36.64 ms2 were set to total power, low frequency and high frequency, respectively. The CAN diagnostic test based on the mentioned reference value was created. The HRV test had a high sensitivity (80.01%-85.09%) and specificity (82.30%-85.20%) for CAN. The estimated CAN prevalence was 14.92% and 29.17% in total sample and diabetic patients, respectively.

Conclusion: Our findings provided reference values for short-term HRV, which were used for the CAN diagnostic test with a high sensitivity and specificity. The estimated CAN prevalence was high in the Chinese population.

Biography

Zi-Hui Tang has completed his MD at the age of 23 years from South China University and PhD at the age of 34 from Fudan University. He is an attending physician in Huashan Hospital and Assistant Professor in Department of Endocrinology and Metabolism. He has published 15 papers in reputed academic journals and serving as an Editorial Board Member of repute. He focuses on decision analysis in medicine, especially in application of Bayesian approaches and artificial intelligence in medicine.

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