SPECTRAL ANALYSIS OF HEART RATE AND ARTERIAL BLOOD PRESSURE VARIABILITY SIGNALS FOR PHYSIOLOGICAL AND CLINICAL PURPOSES.

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Abstract

A bivariate electrocardiogram (ECG)/arterial blood pressure processing procedure is described which aims at extracting a few parameters from the relevant variability series directly quantifying the complex relationship inside the neural controlling system relative to the two signals. Variability signals are detected from patients in resting conditions and during a treadmill stress test with various levels of stress, as well as before and after tilt stimulation. The power spectral density of the variability series is then carried out (autospectra, cross-spectra and coherence) through autoregressive techniques. Besides the usual spectral and cross-spectral analyses, two other parameters, LH and alpha, are obtained, which are functions of the powers associated with the low frequency peak (congruent 0.1 Hz) and the high frequency peak (0.25-0.35 Hz) calculated in the tachogram (heart rate variability signal derived from ECG), and the systolic discrete series values. The proposed parameters seem to be relevant to the beat-to-beat balance of sympathetic and vagal mechanisms in various pathophysiological conditions.
17. Heart rate variability. Task force of the European society of cardiology and the North American society of pacing and electrophysiology. // Eur. Heart J. 1996. V. 17. The dependence of spectral characteristics of HRV from the complex of clinical features of AF of 64 patients: duration, course and form AF, severity of arterial hypertension (AH), functional class (FC) of angina. 38. pectoris, postmyocardium cardiosclerosis and valvular heart disease at which background AF took place, as well as FC of heart failure and types of reaction HR to orthostasis. HRV was researched on 5 minutes intervals of ECG in supine position. The HR, TP, VLF, LF and HF were estimated. The statistical processing of results was performed with the help of Excel for Wi - spectral analysis of heart rate and arterial blood pressure variability signals for physiological and clinical purposes. AU - Cerutti, Sergio. AU - Baselli, Giuseppe. Variability signals are detected from patients in resting conditions and during a treadmill stress test with various levels of stress, as well as before and after tilt stimulation. The power spectral density of the variability series is then carried out (autospectra, cross-spectra and coherence) through autoregressive techniques. Besides the usual spectral and cross-spectral analyses, two other parameters, LH and alpha, are obtained, which are functions of the powers associated with the low frequency peak (congruent 0. 1 Hz) and the high frequency peak (0. 25-0.