33rd International Congress on Electrocardiology

47th International Symposium on Vectorcardiography

June 28th - July 1st, 2006
Koelnmesse • Congress-Centrum Nord
Cologne • Germany

Abstactband

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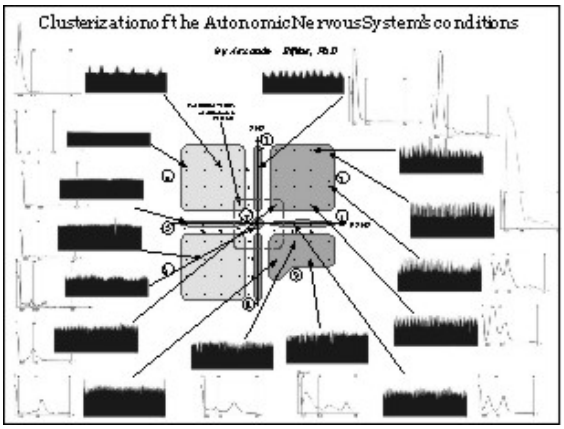
9. F max(LF) - Value of frequency at Smax(LF);
10. F max(MF) - Value of frequency at Smax(MF);
11. HF/LF1 ratio;
12. HF/(LF1 + LF2) ratio;
13. HR.

Result. The proposed algorithm for HRV analyses, called "IntelWave", automatically recognizes 74 clusters of ANS states that represent different relationships between SNS and PSNS activities and variations in their balance. IntelWave then graphs the Parasympathetic activity on the horizontal or X-axis and the Sympathetic activity on the vertical or Y-axis (Fig. 1). The intersection point of the Sympathetic and Parasympathetic axes is the point of Autonomic Balance. To the right of and above this balance point, IntelWave displays an area of increased Parasympathetic and Sympathetic activities in 4 gradations. Decreases in PSNS and SNS activities are shown to the left and below the balance point. 74 ANS states are subdivided into nine categories (circled in red in Fig. 1, with corresponding numbers marking each category - e.g., 1, 2). **Conclusion.** The developed algorithm opens new perspectives for quantitative assessment of the autonomic reaction of the human organism on any therapeutic and other interventions.



PS91

Influence Of The Normal Menstrual Cycle On Circadian Rhythm Of Autonomic Nervous Activity

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The reduction in estrogen levels experienced by postmenopausal women is known to be a cause of ischemic heart disease and sudden cardiac death. And also, the balance of autonomic nervous activity (ANA) in early morning has been postulated as a sign of the prognosis, reflecting increased incidences of sudden death in patients with cardiovascular diseases. We studied the changes in circadian rhythm of ANA that occurred during the normal menstrual cycle of 3 healthy young women (mean age 21.5 years). Holter ECG was monitored during the follicular phase (F-phase) and luteal phase (L-phase). ANA was evaluated by heart rate variability (HRV). The total heart beats/24hrs increased during L-phase, and SDNN/24hrs and CVRR/24hrs reduced during L-phase in all 3 cases. While HR every an hour, high frequency spectra (HF) and low frequency spectra (LF)/HF demonstrated typical circadian rhythm. However, early morning HR during L-phase was significantly higher than that during F-phase (Figure-1) in all 3 cases. HF decreased and LF/HF slowly increased during F-phase. These findings suggest possible basis, at least, for the increased incidence of sudden cardiac death and cardiovascular disease in postmenopausal women, and also high incidences occurring in early morning.□@

PS92

Synchronization Between Main Rhytms Of Cardiovascular System Under Different Regimes Of Breathing

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The aim is the studying of the synchronization between the rhythm with the frequency of 0.1Hz and the two other rhythms (respiration and heartbeat) under different regimes of breathing. **Methods.** We studied 7 healthy volunteers aged 20-34 years. The ECG and respiratory signals were simultaneously measured in the sitting position. Four experiments were performed. First, the signals were registered during spontaneous respiration and the three other experiments were carried out under paced respiration with fixed-frequency (0.25 and 0.1Hz) and the frequency linearly increasing from 0.05Hz to 0.3Hz. **Results.** We observed synchronization between the main heart rhythm (HR) and respiration. All subjects demonstrated the presence of several different n:m epoch of synchronization within one record. Studying synchronization between the low frequency (LF) process and respiration we have not revealed any relationship between the degree of synchronization and the intensities of respiratory sinus arrhythmia and LF oscillations as well as in the case of cardiorespiratory synchronization. For the case of breathing with the frequency of 0.25 Hz we obtain the results coinciding qualitatively with those obtained for the above case of spontaneous respiration. The 0.1Hz breathing leads to the resonant increasing of the HR variability amplitude at this frequency and we observe 1:1 phase and frequency synchronization between the HR and respiration during the entire record. Synchronization between the main HR and the LF rhythm also observed under linearly increasing frequency of respiration. **Conclusion.** We have shown that the three main rhythms in the cardiovascular system can be synchronized with each other. Synchronization between the main HR and the rhythm with the frequency of 0.1Hz is less pronounced than synchronization between each of these rhythms and respiration.

PS93

Analysis Of Heart Rate Dynamics In Congestive Heart Failure

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Introduction. During the last years, wavelet transform has proven to be a valuable tool in many applications areas for analysis of non-stationary signals, and the ECG in particular. The result will be a collection of time-frequency representations of the signal, all with different resolutions. **Method.** The study was performed at the Emergency Hospital No.1, University of Medicine and Pharmacy, Timisoara, Romania. In our study we compared the heart rate variability (HRV) and Continuous Wavelet Transform (CWT) time-frequency spectrum for ECG. For this purpose we used the Continuous Wavelet Transform, under MATLAB 6.5Ò and Autosignal v.1.6 from SYSTAT software, on ECG signals from the MIT-BIH Arrhythmia and ESC-ECG databases. In this study we analyzed 24 types of ECG signals: 8 in sinus rhythm and 16 from recordings of the heart failure ECG databases. The sampling frequency of this ECG signals was 250 Hz. In our study we used most the Mexican Hat and Paul wavelets. **Results.** In this study we proved the value of the CWT for two purposes, first after wavelet decomposition of the ECG we isolated each ECG component of the original signal on