

Classical Music Effects on Time, Frequency and Nonlinear Parameters of Heart Rate Variability Signal

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Background:

Human in everyday life may be exposed to various audio stimuli, including music. Music not only improve quality of life but also may effect on heart rate. In this study, the effect of a kind of classical music in comparison with silence is investigated using HRV signal processing.

Method:

ECG signal of 20 healthy volunteers with the mean age of 24.7 ± 3.9 years is used which include two parts, silence and while listening to a kind of classical music. Data was acquired using a Biopac MP36 data acquisition system. Feature extraction of HRV were calculated in three field including time, frequency and nonlinear during rest and music. Using Kruskal-Wallis statistical test with a significant level of 0.05, twelve effective features among physiological responses of two groups of music and silence were evaluated. Effective features in music group were compared with the controls and then k -nearest neighbor classifier used to distinguish any changes in heart rate induced by the music.

Results:

The results show that the nonlinear parameters have significant responses during music stimuli in comparison with silence. The two groups of music and control were identified with the accuracy of 80% respectively.

Discussion:

This study of HRV using linear and nonlinear techniques has represented significant differences between, before and during music. The results show that the classical music can decrease heart rate and cause calmness.