Impact of Missing RR-interval on Non-Linear HRV Parameters

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Abstract

The impact of missing RR-interval data on nonlinear heart rate variability (HRV) analysis with and without interpolation were investigated. In this study, randomly selected data (with frequency of 5 samples up to 50) were removed from actual data (taking first 1000 samples) in the MIT-BIH arrhythmia RR interval database of 10 subjects having 1000 sample data points in each set. In all, the tachograms the artefacts are removed first from the 1000 samples. Poincare plot and entropy analysis were executed for the nonlinear HRV parameters, and the absolute relative errors between the data with and without the missing data duration for these parameters including the interpolation were calculated. In this process, the usefulness of reconstruction was considered when there is missed rr-interval, for which several interpolation methods (linear, delete, and zero order interpolation) were used and the best interpolation method having less error in the HRV analysis was chosen. During the work and performing all the interpolation methods, the delete interpolation gives best results for the reconstruction of data while analysing the HRV non-linear parameters.
References


Index Terms

Computer Science Information Sciences

Keywords

HRV Analysis, Poincare Plot, Entropy, Missing data, Interpolation