

Comparative Heart Rate Variability Analysis for Patients with Severe Mitochondrial Disease

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OBJECTIVE

Complex variability of as a measurement of the precise adjustments made to biometrics in response to and following stressors

Patients with severe mitochondrial disease compared to healthy patients

Heart rate variability chosen as one metric to analyze complexity

BACKGROUND

Mitochondrial Stress, Brain Imaging, & Epigenetics (MiSBIE) Study

Patients: 70 healthy & 40 with severe mitochondrial disease

Readings:

- Baseline after 25 minutes resting
- First samples
- Instructions for task given
- Speech preparation
- Public speech
- Post 5-120 minutes
- Deep breathing task
- Sit & stand
- Repeated sitting & standing
- Submerge hands in ice bath

METHODS

RHRV Library for Time Series & Frequency Domain Analysis

Time Series Analysis

- R-MSSD: compare time between consecutive beats (short-term HRV)
- SDNN: standard deviation of time between beats (overall HRV)
- HRVi: ratio of total number of heart beats to most common interval from interval histogram

Frequency Domain Analysis:

- Continuous wavelet transformation was used to calculate HRV by estimating the power of different frequencies at different time points.

Two-sample t-tests and Wilcoxon signed rank texts were conducted per study phase between HRV measures belonging to healthy patients and those belonging to people with mitochondrial disease.

DATA & STATISTICAL ANALYSIS

