

Research Article

Effect of stress relief music (3.2 Hz Delta Brain Waves) on basal heart rate variability in an adult male

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Introduction

The modern life of people is associated with stress. It is involved in unlocking of various diseases. That is why factors that suppress stress are of great importance and extremely relevant at the moment.

Measurement of heart rate variability is the only method for quantitative analysis of autonomic nervous system function. It consists of 2 main parts - sympathetic and parasympathetic. The sympathetic is activated when stress occurs, and the parasympathetic when at rest. The sympatho-vagal balance (the LF/HF ratio) shows the adaptation abilities of the corresponding human organism to stressful situations.

Musical tones with a certain frequency (3.2 Hz, 132 Hz, 432 Hz, etc.) have been found to have a beneficial effect on brain function under stress.

Material

The subject of this study is a 61-year-old man, 178 cm tall and 75 kg in weight (BMI = 24).

Method

For heart rate recording, we used the "Polar H10" Chest Strap (with Bluetooth BLE signal transmission). The analysis of the results obtained from the heart rate variability (HRV) measurement was carried out with the "Kubios HRV" software.

Immediately after waking up in the morning at 8 o'clock, a short term (3 min.) measurement of HRV parameters was performed in basal conditions (in a lying position, at complete rest and silence, at a comfortable room temperature) (see Fig. 1, 2 and 3).

After listening for 30 min to stress relief music (3.2 Hz Delta Brain Waves), a second measurement of HRV parameters was taken (see Figs. 1A, 2A and 3A).

Results

The results obtained from this study are presented in Fig. 1, 2, 3, 1A, 2A and 3A.

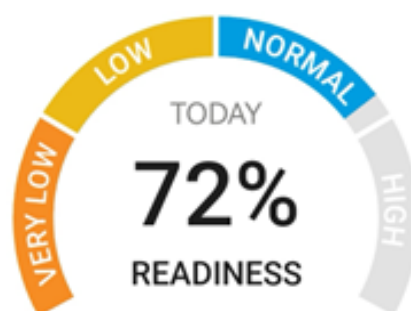


Figure 1: (basal HRV-measurement)

RESTING HRV	
Heart rate	58 bpm
RMSSD	17 ms
PNS index	-0.17
SNS index	1.41
HRV PARAMETERS	
Mean RR	1029.73 ms
SDNN	17 ms
Poincaré SD1	11.71 ms
Poincaré SD2	20.93 ms
Stress index	21.72
Respiratory rate	12.37 breaths/min
LF power	99.27 ms ²
HF power	126.54 ms ²
LF power (n.u.)	43.95 %
HF power (n.u.)	56.03 %
LF/HF ratio	0.78
MEASUREMENT QUALITY: GOOD	

Figure 2: (basal HRV - measurement)

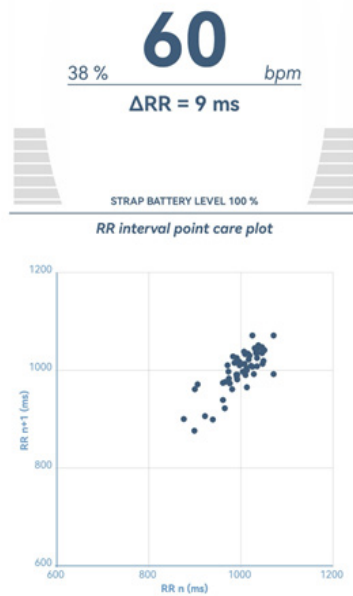


Figure 3: (basal HRV - measurement)

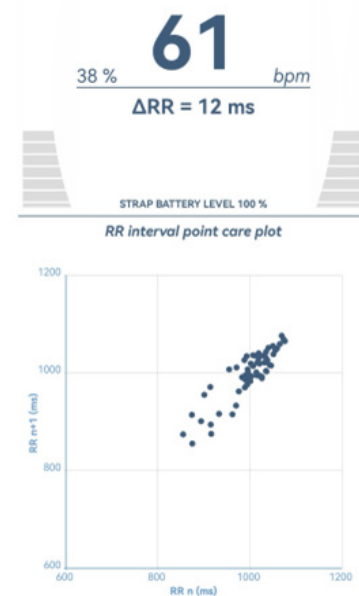


Figure 3 A: (after stress - relief music)

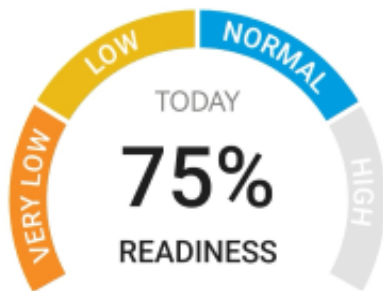


Figure 1A: (after stress-relief music)

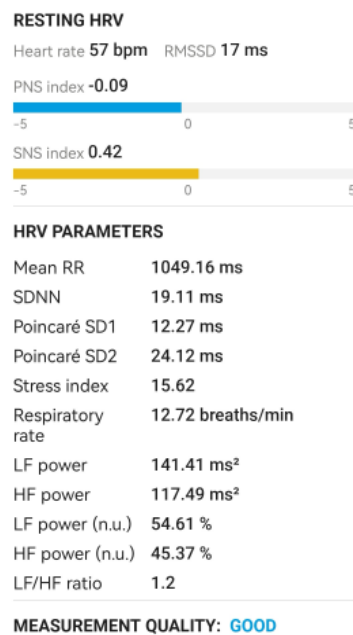


Figure 2 A: (after stress-relief music)

Discussion

The most accurate measurement of heart rate variability is that, what is done under basal conditions (in the morning immediately after waking up at complete rest). We therefore decided to investigate the influence of the stress relief music (after 30 min of listening) immediately after baseline HRV measurement.

The obtained results show that when compared to basal HRV- parameters after 30 min of listening to this music, the readiness index is slightly higher, the stress index is slightly lower, the average duration of RR-intervals is slightly larger, and the LF/ HF ratio (indicating sympatho-vagal balance) remains almost the same.

Conclusion

This study shows that this art of music reduces stress and improves HRV. Therefore, we recommend this type of music to be used for relaxation after stressful situations.

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