



AUTONOMIC NERVOUS SYSTEM FUNCTION IN ATTENTION DEFICIT HYPERACTIVITY DISORDER

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Introduction:

The problem of attention deficit and hyperactivity disorder (ADHD) is important not only in children but also in adults. Adults with ADHD often need to control their attention with medications. Mental work and the attention require appropriate activation of the sympathetic and parasympathetic nervous system.

Aim of the study:

Determine peculiarities of autonomous system balance and reactivity during stress response in adults with ADHD in comparison with healthy people.

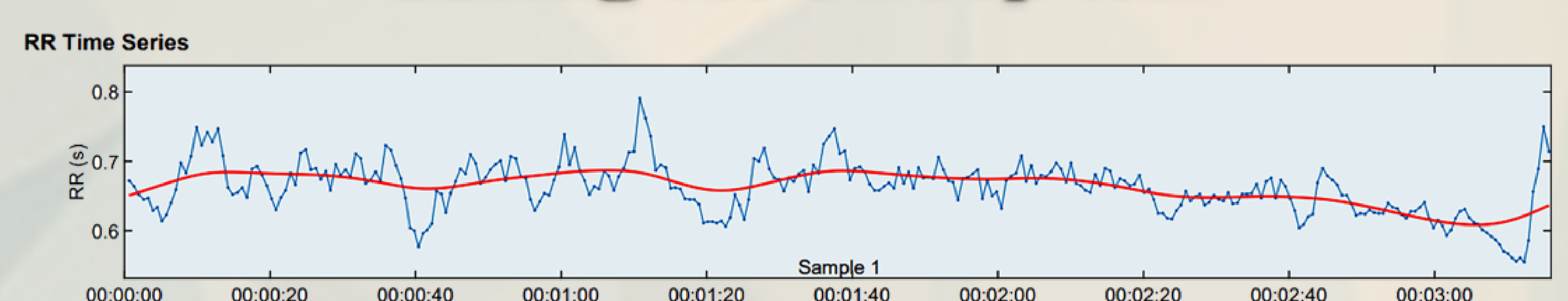
Material and Method:

Eighteen subjects (9 adult young patients with DSM-IV ADHD diagnosis, 9 age matched healthy controls) underwent orthostatic test and standardized mental stress test (Stroop test). After resting in the supine position, 12 min ECG was recorded with a Polar H10 device and EliteHRV software during the orthostatic test. After that another 3.5 minutes ECG was recorded during the Stroop test. Kubios HRV software was used for analysis of time-domain parameters of heart rate variability. The balance and reactivity of the sympathetic and parasympathetic nervous systems was evaluated in the following intervals: 5 minutes lying down, two minutes transition to standing position, 5 minutes in standing position, 3.5 minutes Stroop test.

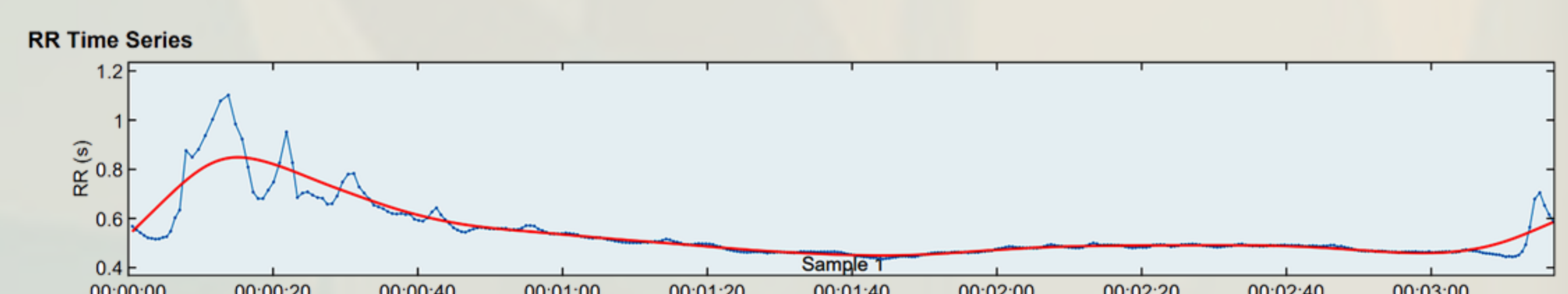
Results:

In both ADHD and control groups subjects with increased sympathetic nervous system reactivity to orthostatic test and Stroop test were present. ADHD subjects were characterized with a tendency to higher heart rate in supine position (84,3 vs 73 bpm) and had a lower reactivity to a mental stress test in comparison to healthy controls (change of mean RR duration 11.4% vs. 20.6%, maximum heart rate 14.1% vs 24%, but higher SDNN reaction 17.5% vs -5%). Picture A shows the differences between two different subjects during stroop test. we can see that graph no. 1 shows multiple changes in amplitudes that suggests relative balanced response between sympathetic nervous system to the parasympathetic nervous system. on the other hand, graph no. 2 shows almost no amplitude change and persistent shorter RR intervals (higher heart rates) with lower variability of the heart rate what imply for imbalanced autonomic nervous system and prevalence of the sympathetic nervous system over the parasympathetic.

Picture A. Measurement of the HRV during the Stroop test



Graph 1



Graph 2

Conclusion:

ADHD patients might be characterized with a different pattern of autonomous system activation in reaction to orthostatic and mental stress. Additional research is needed to analyze peculiarities of autonomous nervous system response to orthostatic test and mental stress test in ADHD adults.

Acknowledgment:

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