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BOOK OF ABSTRACTS

Heart rate variability in adolescents with irritable bowel syndrome

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Background. Dysfunction of brain-gut interaction plays an important role in the pathobiology of irritable bowel syndrome (IBS). Bidirectional communications within gut-brain axis are modulated by the autonomic nervous system. The aim of current study was to evaluate autonomic dysfunction and stress resistance in adolescents with irritable bowel syndrome by non-invasive method of heart rate variability (HRV).

Methods. We enrolled 30 adolescents aged 12-18 years with a verified diagnosis of various types of irritable bowel syndrome. Control group included 35 healthy adolescents aged 14-20 years. Time and frequency domain parameters of HRV were studied in short recordings (5 min.) in supine and standing positions. The spectral HRV analysis included assessment of total power (TP, 0.01-0.4 Hz), which reflects the total activity of regulatory components; very low frequency power (VLF, 0.01-0.04 Hz), which characterizes mainly the activity of the neurohumoral regulation component and cerebral ergotropic effects; low frequency power (LF, 0.04-0.15 Hz, predominantly sympathetic activity); high frequency power (HF, 0.15-0.4 Hz, reflects mainly vagal component of the heart rate regulation).

Results. To facilitate interpretation of the results, we divided all individuals into the subgroups of resistance based on the values of TP in the supine position (low-resistant, medium-resistant, highly resistant). Subgroup analysis demonstrated that IBS patients with the lowest and highest TP in supine position had significantly reduced LF at rest. Also we have revealed significant downregulation of the LF component in the low-resistant and high-resistant IBS subgroups especially in standing position.

Conclusions. Non-invasive HRV monitoring is a useful diagnostic biomarker of functional and metabolic reserve and thus, the stress resistance of the body. We have revealed that adolescents with IBS have decreased parameters of HRV, but it was founded mostly during orthostatic testing. Suggested division into groups of resistance according to the TP and helped us to detect significant decrease in the sympathetic activity (LF) in patients with IBS compared to healthy controls. Study of heart rate variability is a useful method to evaluate autonomic function and, thus, gut-brain interactions in subjects with IBS.