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Results of autonomic testing in children with migraine with and without syncope

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Background: Despite the signs of involvement of autonomic nervous system (ANS) in the pathomechanism of migraine, the significance of dysfunction was not fully explained. One of the parameters serving to establish a balance of both ANS parts is relation of low frequency (LF) to high frequency (HF) spectrum of heart rate variability (HRV), LF/HF ratio. HF reflects parasympathetic activity, whereas LF both sympathetic and parasympathetic activity as well as respiratory rhythm.

Aims: The aims of the study was to establish LF and HF ratio in children with migraine with aura, during rest as well as during passive tilting and also during active standing. Prospective research, approved by Bioethical Commission of Jagiellonian University, KBET/188/B/2011.

Material and methods: The examination was performed in 86 children with migraine during a headache-free period and in 32 children without headaches and syncope, constituting an age-matched control group. HRV was evaluated during rest, during a 10-min 70 degrees head-up passive tilting and during 3-min active standing test, using Task Force Monitor 3030i/3040i. Results: In 47 children with migraine with aura head-up tilt test was negative for syncope. Postural orthostatic tachycardia syndrome (POTS) was diagnosed in 4/24 children with migraine with sensory aura, as well as in 1/39 children with migraine without aura. In 2/39 children with migraine without aura and in 2 controls head-up tilt-induced syncope occurred. Results of LF/HF ratio did not differ between groups with migraine with aura and controls, but they were significantly higher in group of 24 children with migraine with sensory aura during passive tilting. Active standing did not reveal differences of LF/HF ratio between any groups.

Conclusions: Predominance of sympathetic nervous system activity during passive head-up tilt test, as well as more common POTS in patients with migraine with sensory aura as compared with children with migraine with visual aura and healthy volunteers indicate differential autonomic reactivity. False positive result of passive tilting in healthy children may suggest a higher risk of syncope. In spite of poor orthostatic tolerance reported by patients with migraine, active standing did not reveal differences between migraine patients and healthy volunteers.

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