



Analysis of Auditory Brainstem Responses in musicians with additional contralateral stimulation

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This study is based on research that involved assessing the functioning of the auditory system at the level of the brainstem, with the use of electrophysiological methods of hearing testing. This work focuses on the influence of two basic factors that may affect the parameters of the recorded ABR (Auditory Brainstem Response), i.e. musical education and auditory contralateral stimulation (CS). The available research papers in this field focus mainly on the analysis of mid- and late-latency auditory potentials, not short-latency studies, which ABR research falls under.

The main aim of the study was to assess the influence of contralateral stimulation on the latency values and amplitudes of ABR potentials in a group of musicians with many years of music education, as well as in people without music education. Two types of contralateral stimuli were used: babble noise - a signal without information content, and the Polish Sentence Test - a signal reflecting the basic form of information transfer. The level of the contralateral signals was 60 dB SPL. In the group of active, professional musicians there were seven participants who had started their musical education at the age of about 7. The second group consisted of 6 subjects who had not studied music and had not learned to play any instrument. The age of the participants ranged from 22 to 32 years. All subjects had normal hearing. The ABR measurements were made using an Eclipse EP15 Interacoustic system, using additional Etymotic ER-2 headphones and the Fostex PH-50 amplifier for contralateral stimuli. The stimulus evoking ABR potentials was CE-Chirp (CE - Claus Elberling) presented in the level range from 10 to 70 dB nHL. The entire measurement system was calibrated using the Bruel & Kjaer type 4128-C head and torso simulator.

The contralateral babble noise in the group of musicians caused a statistically significant decrease in the V-wave latency, and the stimulation of CS with the Polish Sentence Test caused a significant increase in the V-wave latency in the ABR notation. The CS did not significantly affect the V wave amplitude. In the group of non-musicians, a statistically significantly higher V wave amplitude was obtained than in the group of musicians. Regardless of the CS and the level of stimulation of the stimuli evoking ABR, statistically significantly lower values of wave III latency were recorded in the group of musicians. Moreover, in the group of musicians, regardless of the CS, a statistically significantly lower amplitude of wave III was found. Summing up, the results of the research showed that the factor significantly differentiating the ABR results is the study group (musicians, non-musicians), while the CS has no significant influence on the recorded ABR parameters.