Application of Auditory Brainstem and Cognitive Responses in differential diagnosis of central nervous system diseases

Tóth F, Kiss JG, Nagy AL, Szabados ÉM, Jóri J
University of Szeged, Department of Otolaryngology, Head and Neck Surgery Szeged, Hungary

Introduction

The frequency of the stimuli influence the features of evoked potentials. Usually about 10 Hz stimulus frequency is employed at BAEP examinations, because responses are most stable at this frequency. The greater the frequency of the stimuli the most valuable changes of the characteristics of the BAEP could be found. We performed a systematic series of measurements in order to specify how the values of latencies and amplitudes change at the stimulus rates above 10 Hz in case of healthy patients. And other hand what differences could be found between the healthy and the patients suffered from central nervous system diseases in the same measuring circumstances. The cognitive components of auditory event-related potentials (ERP) signify the brain’s detection of acoustic change. These endogenous cortical responses (mismatch negativity, N2b and P300) reflects the neurophysiologic processes that underlie auditory discrimination.

ABR examinations

We recorded auditory brainstem and cognitive responses to study the central auditory processes in 14 healthy persons with normal hearing and 10 patients suffering from central nervous system disease (sclerosis multiplex). We performed BAEP examinations at 14 different frequency levels of stimuli (10, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64 Hz) in case of patients. Our investigations was performed with Dantec Counterpoint MK 2. In each case vertex-ear-lobe electrode and unfiltered click stimuli were applied. The intensity of the tones was 80 dB above the threshold.

Discussion

The problems of central nervous system influence the waveform of cognitive event-related potential components including MMN, N2b and P300. The amplitudes was decreased and the latencies was increased in patients’ group compared with control group. The difference was most defin in the case of P300 component. Finally we suggest that the BAEP examinations using different frequency of stimuli and cognitive ERP examinations could be useful methods in differential diagnosis of the central nervous system diseases.