Efficacy of transcranial motor-evoked potentials in avoiding the postoperative neurologic deficit for brain tumors with allocation in eloquent regions

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Abstract

Background: Motor-evoked potentials (MEPs) are the well proven method to assess the descending motor pathways and detect neurological impairment. Muscle action potentials of the upper or lower limbs are the responses to the central stimulation. This study aimed to elucidate the clinical efficacy of TcMEP monitoring during resection surgeries of tumors from eloquent brain areas.
Material and methods: TcMEP monitoring data of 83 patients were prospectively reviewed. The patient's age varied between 16 and 81 years, 44 males (53.0%), 39 females (46.4%). None of these patients had a neurological deficit before the surgery. The MEPs were evoked by transcranial electrical stimulation through spiral electrodes placed over the primary motor cortex and were recorded by needle electrodes inserted into the following muscles: biceps, abductor pollicis brevis, and anterior tibialis muscles. MEPs were continuously recorded throughout surgery. The following stimulation parameters were used: number of pulses – 5, duration of each pulse – 0.5 ms, inter-pulse interval between – 2-4 ms, stimulation intensity –50-150 mA. When MEP amplitudes decreased by more than 50%, MEP stimulation was repeated and MEP changes were reported to the surgeon.
Results: No postoperative motor deficit was found in 71 out of 83 patients with stable MEP amplitudes. Postoperative paresis developed in 12 patients. MEP decrease in amplitude (>50%) occurred in six patients (7.2%). Two patients had permanent paresis, caused by vascular injury during tumor resection.
Conclusions: Monitoring of motor-evoked potentials during brain tumors operations located within or adjacent to eloquent brain regions is an effective technique to detect acute intraoperative injury and to avoid postoperative neurologic deficit.
Key words: motor-evoked potentials, eloquent brain areas, postoperative paresis.

Epileptic encephalopathy with CSWS: clinical case

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Abstract

Background: Continuous spike-wave of sleep syndrome (CSWS), according to the ILAE, is characterized by epileptic seizures, neurocognitive deterioration, and specific EEG changes, mainly affects girls (40/60 ratio) between the age of 4 – 7 years. The aim of the study is the analysis of the clinical case of the CSWS in the context of scientific literature and prognosis evaluation, assuming correct application of the international protocol.
Material and methods: Clinical case presentation.
Results: A 10-year-old girl (18.09.2002) came in on 21.09.2012 with history of myoclonic seizures. Hypnogenic myoclonic jerks were described on the night video-EEG monitoring. The awake EEG pattern was unremarkable, but the sleep EEG pattern had characteristic signs of CSWS. The patient has no pathological history, the MRI was unremarkable. The therapy with clobazam 10 mg in the evening was initiated. Night video-EEG monitoring on 08.06.2013 was unremarkable. The patient is monitored for 9 years. On 27.07.2018, the dose was adjusted (5 mg). At the moment the patient is without neurocognitive decline, under treatment and continues the scheduled follow-up. From the epidemiological and symptomatic point of view, our case is homogeneous according to literature, located in the first standard deviation of the Gaussian curve. Considering the diagnosis, the recommended treatment achieved the goals: cessation of seizures, normalization of the EEG pattern, and the preservation of neurocognitive abilities.
Conclusions: In the case of a non-structural etiology, early diagnosis and treatment initiation, provides favorable prognosis, with preservation of neurocognitive abilities and cessation of clinical and electrophysiological signs.
Key words: CSWS, video-EEG monitoring, clobazam.