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Neuronal loss and angiogenesis are suppressed with cerebellar transcranial direct current stimulation in pentyelenetetrazol kindled brain

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Background and aims

Loss of neurons and angiogenesis underlay pathogenesis of chronic epilepsy. The aim of the work was to investigate the neuronal and microvascular density of the frontal cortex, ventral hippocampus, and retina of pentylenetetrazole (PTZ)-kindled rats.

Methods

Kindling was produced in Wistar rats by three-week PTZ (Sigma Aldrich, 35.0 mg/kg, i.p.) administration. Transcranial direct current stimulation (tDCS, 600 μA), an anode on the skull over the cerebellar surface performed before PTZ injections. Light microscopy was performed on H&E-stained slides, and quantification of neurons was performed using Image J software.

Results

The density of neurons in the frontal cortex and hippocampus (CA3) of kindled rats exceeded such ones in control by 3.4($P < 0.001$) and by 4.9 times ($P < 0.001$) correspondently. Both indices heightened by tDCS and exceeded corresponded control data by 47.5% and by 27.4% ($P < 0.05$). Cell density in retinal ganglion layer was 2.14 times lower ($P < 0.05$), and in the inner and outer nuclear layers, it was 41.0% and 19.0% lower, respectively ($P < 0.05$) compared to the control. After tDCS, neuronal density in the ganglion layer and inner nuclear layer exceeded such ones in kindled rats by 38.0%($P < 0.05$) and 30.5%($P < 0.05$). The number of microvessels in the frontal cortex was 24.33 ± 2.19 per 490.000 mcm^2 and exceeded in the control by 44.5% (13.5 ± 0.50), ($P < 0.05$). tDCS caused a decrease in the microvessels density when compared with kindled rats by 23.1%($P < 0.05$).

Conclusions

Cerebellar tDCS prevents neuronal loss and angiogenesis in brain and retina on the PTZ-induced chronic brain epileptization.

Funding support: Ministry of Health Care of Ukraine (grant N0121U114510).

doi:10.1016/j.jns.2023.121505

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Clinical application and yield of continuous video-EEG (CEEG) for evaluation of altered mental status and seizures in a tertiary health center

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Background and aims

Continuous video-EEG (cEEG) monitoring is an important neurophysiology tool for the diagnosis and management of seizures. Here we reviewed the yield of cEEG in a tertiary health care center.

Methods

This is a retrospective study approved by McGill University Health Center REB. We reviewed clinical information as well as EEG findings, from all patients who underwent a minimal of 24 h cEEG over a period of 24 consecutive months.

Results

A total of 120 patients were identified. Mean duration of cEEG was 2.1 days (range: 1–14 days), for a total of 251 days for all patients. Reason for cEEG was altered mental status (AMS, 29%) or suspected seizures (71%). Underlying etiologies included: vascular (24%), structural (18%), toxic/metabolic/anoxic (22%), infectious (3%), previously known epilepsy (13%), traumatic brain injury (8%), autoimmune (7%), PNES (2%) and unclear (5%). Seizures were captured in 25 (21%) patients, being EEG-only in 10. Clinical events not associated with EEG abnormalities were recorded in 30 (25%) patients. Status epilepticus was diagnosed in 14 (12%) patients, 9 of them (62%) being nonconvulsive. Sedation with IV anesthetics was present in 49% of patients, with burst-suppression EEG pattern in 17 (14%). Periodic discharges were present in 15 (12.5%) patients and interictal epileptiform discharges in 42 (35%) patients.

Conclusions

Seizures were captured in only 21% of patients. Low average duration of cEEG might reflect low suspicion of seizures in these patients with underlying etiologies which could cause AMS not associated with seizures.

doi:10.1016/j.jns.2023.121506

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Mental disorders in cerebral paroxysms of epileptic origin

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Background and aims

To study mental disorders in cerebral paroxysms of epileptic origin.

Methods

Clinical, clinical follow-up, experimental psychological, statistical.

Results

We analyzed mental disorders in 1969 patients with epilepsy at the Interdisciplinary center for the prevention of paroxysmal conditions between 2001 and 2019. The frequency and structure of psychopathological manifestations depended on duration of disease, presence of neurological symptoms and focality of the lesion on MRI, and adequacy of rehabilitation measures. Cognitive disorders predominated (83.8%). Disorders of the affective sphere were (59.4%) in the form of irritability, low mood, emotional lability, the tendency of patients to anxiety reactions. Asthenic syndrome was detected in 35.3% of patients, autonomic disorders were significantly more often (mental disorders comorbid with organic pathology). Hallucinatory-delusional disorders were less frequent (2.1%). Psychopathological symptoms in cerebral paroxysms of epileptic genesis were associated with the phase – preictal mental disorders were more often characterized by cephalgia, ictal symptoms were polymorphic (18.9%), postictal psychopathological manifestations were observed in 1.9% in the form of confusion, acute sensory delirium against the background of altered affect, interictal mental disorders were in 870 patients (87.6%), and were represented by