intensity caused up to twice reduction of spikes frequency or complete suppression of focal activity.

Conclusions

Modulative effects of paleocerebellar ES on cortical penicillin foci depend on its intensity. Diazepam in high dose abolished effects of low-intensity ES while higher intensity induced suppression of epileptic activity.

doi:10.1016/j.jns.2021.119090

119091

The effects of antiepileptic drugs on high-frequency oscillations in somatosensory evoked potentials

Giovanni Assenza[a], Jacopo Lanzone[b], Marilisa Boscarino[a], Lorenzo Ricci[c], Angelo Insola[a], Mario Tombini[c], Vincenzo Di Lazzaro[c], *[a]Campus Bio-Medico University, Neurology Department, Rome, Italy, [b]Università Tor Vergata, Department of Systems Medicine, Neuroscience, Rome, Italy, [c]University Campus Bio Medico, Unit of Neurology, Neurophysiology, Neurobiology, Rome, Italy*

Background and aims

High frequency oscillations (HFOs) of Somatosensory evoked potentials (SEPs) reflect the activity of thalamo-cortical and cortical neurons from the sensory pathway. Antiepileptic-drugs (AEDs) reduce seizures acting on the balance between excitation and inhibition. We aimed to study the effect of AED mono and polytherapy on SEP-HFO's components.

Methods

Twenty-five patients with focal epilepsy were enrolled for the purpose of this study. Patients were divided in 3 groups according to the number of AEDs (1, 2 or 3 AEDs). Patients in group 1 underwent SEP-HFOs recording in drug naïve condition and at 1 month after AED titration. HFOs were compared in duration, amplitude and latency among the three groups.

Results

The amplitude and duration of late HFOs of the affected hemisphere (AH) are different between groups and inversely correlated with the number of AEDs. In naïve patients monotherapy reverts the asymmetry in totHFOs (total HFOs) duration.

Conclusions

Our results demonstrate that SEP-HFOs are sensitive to the action of AEDs on cortical excitability. This effect seems to affect mainly the cortical component of HFOs in the AH and it is related to the number of AEDs taken. Significance: SEP-HFOs might be a viable tool to probe cortical excitability changes induced by AEDs.

doi:10.1016/j.jns.2021.119091

119092

The use of optically pumped Magnetoencephalography (OP-MEG) in epilepsy

Umesh Vivekananda, *University College London, Department of Clinical and Experimental Epilepsy, London, United Kingdom*

Background and aims

Magnetoencephalography (MEG) has been used in specific cases of refractory epilepsy due to its inherent properties of excellent spatial resolution and relative immunity to muscle artefact. However current MEG systems are high maintenance and restrictive for the patient, meaning that recording sessions are usually brief (1–2 h), thereby limiting its availability in the clinical setting. Our aim was to demonstrate the first use of Optically Pumped Magnetoencephalography (OP-MEG) in two epilepsy patients with unrestricted head movement. Unlike conventional MEG that uses a superconducting SQUID system, here we use a different type of sensor (OPM), which operates at room temperature and crucially can be placed directly on the patient's scalp, permitting free head movement.

Methods

We performed three OP-MEG recording sessions in two patients with refractory focal epilepsy (right posterior temporal focus in patient 1 and left frontal focus in patient 2), who were able to perform natural movements within their environment. We then compared these recordings with clinical scalp EEG performed earlier. In the second patient we also incorporated motion capture in order to regress out head movement from the MEG signal.

Results

OP-MEG was able to identify analogous interictal activity to scalp EEG including spikes, polyspikes, sharp waves and spike and wave activity. We were able to source localise this activity using both linearly constrained minimum variance (LCMV) beamformer and equivalent current dipole (ECV) methods to an appropriate brain region.

Conclusions

This is the first application worldwide of OP-MEG in human epilepsy. Future directions include simultaneous EEG/OP-MEG recording and prolonged OP-MEG telemetry.

doi:10.1016/j.jns.2021.119092

119093

Pioglitazone intensifies antiseizure effects of cerebellar transcranial direct current stimulation (TDCS) upon kindled seizures

Mykhailo Pervak[a], Leonid Godlevsky[a], Olesya Poshyvak[b], Kirill Latypov[a], Kseniya Prybolovets[a], *[a]Odesa National Medical University, Department of Biophysics, Informatics and Medical Devices, Odesa, Ukraine, [b]Danylo Halytsky Lviv National Medical University, 2Pharmacology Department, Lviv, Ukraine*

Background and aims

The suppression of epileptic activity follows TDCS. It was shown that blocking peroxisomal proliferator-activated γ-receptors (PPARγ) with BADGE, (100 mg/kg, i.p.) prevented antiseizure effects caused with cerebellar TDCS (Godlevsky L.S., Pervak M.P., 2019). Aim. To investigate effects of cerebellar TDCS under conditions of treatment with the agonist of PPARγ pioglitazone upon pentylenetetrazol (PTZ) - kindled seizures.

Methods

In rats the kindling was induced via PTZ (35.0 mg/kg, i.p.) for three weeks. TDCS was performed at 250 μA intensity for 10.0 min, with cathode on the skull surface oriented to the cerebellar cortex.

Pioglitazone (100.0 mg/kg) was administered i.p. in 30 min before TDCS.

Results

TDCS caused the tendency to increase the latency of first seizures by 26.3% when compared with control (70.89 + 14.20 s) ($P > 0.05$) and reduced the seizure severity to 3.62 + 0.92 from 4.22 + 0.67 points in control ($P > 0.05$). Pioglitazone (100.0 mg/kg i.p.) increased the latency by 31.4% up to 103.38 + 17.08 s ($P < 0.05$) and seizures were reduced to 3.5 + 0.76 points ($P > 0.05$). TDCS in rats treated with pioglitazone (100.0 mg/kg, i.p.) resulted in increasing the latency by 42.2% ($P < 0.05$) (up to 122.7 + 31.84 s) and reduced seizures by 31.3% ($P < 0.05$) (up to 2.9 + 0,74 points). Both TDCS and pioglitazone did not affect the length of ictal potential delivered separately. The length of ictal potential was shortened by 45,0% ($P <$ 0,05) (up to 15,92 + 9,66 s) when TDCS was performed after pioglitazone administration.

Conclusions

Under conditions of treatment with pioglitazone paleocerebellar, TDCS caused pronounced antiseizure effects. That leads to the role of PPARγ in the realization of cerebellar antiseizure action.

doi:10.1016/j.jns.2021.119093

119094

Epilepsy in Pakistan: Frequency and common epilepsy types in a tertiary care hospital

Fizza Orooj[a], Ramsha Siddiqui[b], Arsalan Ahmad[b], Maimoona Siddiqui[b], *[a]Shifa International Hospital, Shifa Tameer-e-Millat University, Neurology, Islamabad, Pakistan, [b]Shifa International Hospital, Shifa Tameer-e-Millat University, Neurology, Islamabad, Pakistan*

Background and aims

To determine the frequency and demographics of types of epilepsy presenting to a neurology outpatients facility in a private tertiary care JCIA Accredited University hospital in Islamabad, Pakistan.

Methods

We extracted the data from our neurology outpatient database registry from July 2014 to November 2018. This registry is approved by the Institutional Review board and Ethics committee of our hospital. A patient was diagnosed with epilepsy if there was clear evidence of recurrent epileptic seizures, with the documentation being made by a neurologist on a standard diagnostic database form.

Results

Out of 10,047 recorded in this time period, 1265 patients (12.6%) had epilepsy, 57.9% were male and 42.1% were female with a mean age of 25.77 ± 16.6 years. Focal epilepsy with or without secondary generalization was the most common type, seen in 49.1% of cases, with mean age of 26.35 ± 17.2 years with 61% males; followed by generalized epilepsy in 45.2% with almost similar age (25.85 ± 16.2 years) and gender distribution (56.3% males vs 43.7% females). Juvenile Myoclonic epilepsy constituted 3.5% cases (mean age 25 ± 12). Lennox –Gastaut Syndrome (LGS) was seen in 1.1%; Benign partial epilepsy with centro-temporal spikes in 0.4%; febrile seizures in 0.4%; West Syndrome in 0.1%; and epilepsy not specified in 0.2% cases.

Conclusions

The most common epilepsy was focal epilepsy with or without secondary generalization followed by generalized epilepsy and epilepsy in general is more common in males than females.

doi:10.1016/j.jns.2021.119094

119095

Drug-resistant epilepsy secondary to perinatal damage: Do interictal epileptic discharges matter?

Davide Fonti[ab], Antonella Muroni[c], Lorenzo Polizzi[c], Monica Puligheddu[bc], Giovanni Defazio[bc], *[a]University of Cagliari, Department of Biomedical Sciences, Cagliari, Italy, [b]University of Cagliari, Department of Medical Sciences and Public Healt, Cagliari, Italy, [c]Azienda Ospedaliero Universitaria di Cagliari, Institute of Neurology, Cagliari, Italy*

Background and aims

Perinatal damage represents a frequent cause of drug-resistant epilepsy (DRE). Abnormal EEG findings has been described as a risk factor for DRE. Our aim was to explore the relationship, if any, between interictal epileptic discharges (EDs) and drug responsiveness in epilepsy secondary to perinatal causes.

Methods

We selected patients with focal epilepsy due to perinatal events from our Adult Epilepsy Centre database. DRE was defined as proposed by the International Ligue Against The Epilepsy (ILAE). Ambulatory EEG findings for each patient were classified by the presence or absence of interictal EDs.

Results

We recruited 53 patient, 33 men and 20 women aged 42.2 (SD, 11.7) years. Twenty-four patients had DRE. Patients who responded to drug treatment and those who did not were similar for age and sex but differed for interictal EDs that were more frequent in the DRE group (15/24 vs. 10/29; Pearson Chi square, $p = 0.04$).

Conclusions

Among patients with epilepsy secondary to perinatal damage, EDs during ambulatory EEG are more frequently encountered in drug resistant patients. In this group, ambulatory EEG may be not only a diagnostic aid but may also have prognostic value.

doi:10.1016/j.jns.2021.119095

119096

Skull-base temporal encephalocele: Hidden cause of temporal lobe epilepsy

Akash Chheda[a], Rajit Pillai[b], Sangeeta Ravat[c], Dattatray Mazumdar[d], Shilpa Sankhe[e], Shruti Agrawal[f], *[a]Assistant Professor Seth GS Medical College and KEM Hospital, Neurology, Mumbai, India, [b]Epilepsy Fellow Seth GS Medical College and KEM Hospital, Neurology, Mumbai, India, [c]Professor Seth GS Medical College and KEM Hospital, Neurology, Mumbai, India, [d]Professor Seth GS Medical College and KEM Hospital, Neurosurgery, Mumbai, India, [e]Neuroradiologist Seth GS Medical College and KEM Hospital, Radiology, Mumbai, India, [f]KEM Hospital, Department of Neurology, Mumbai, India*

Background and aims

Among patients with Temporal lobe epilepsy (TLE), up to 30% can have normal (non-lesional) MRI scans. With increased use of high resolution MRI (3 T) scans, many of the MRI-negative TLE cases turn out to be lesional TLE. Skull-base temporal encephalocele (TE), has to be suspected and specifically searched for among patients with