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Keywords: EEG resting state networks, Focal epilepsy

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P361 Test-Retest reliability of the spatial distribution of high frequency oscillations (HFO) in intracranial EEG—Ece Boran [1], Sergey Burnos [1], Tommaso Fedele [1], Niklaus Krayenbühl [1], Peter Hilfiker [2], Thomas Grunwald [2], Johannes Sarnthein [1] ([1] University Hospital of Zurich, Neurosurgery, Zurich, Switzerland, [2] Swiss Epilepsy Centre, Epilepsy Unit, Zurich, Switzerland)

Purpose: High frequency oscillations (HFO 80–500 Hz) are recognized as biomarkers for epileptogenic brain tissue to be resected in epilepsy surgery. We analysed here the test-retest reliability of HFO recorded at different times.

Method: We analyzed long-term invasive night recordings of 11 patients who subsequently had an area of the brain resected and achieved seizure freedom. Four patients had mesial temporal lobe epilepsy (TLE) and seven extratemporal epilepsy (ETLE). For each night, 30-min recordings were extracted during slow wave sleep, artifacts were removed and recordings were segmented into 5-min intervals. HFO were detected by a fully automated algorithm and contacts with the highest rate designated the HFO area for each interval.

Results: The resected area included the HFO area for all intervals in 3/4 TLE and 5/7 ETLE patients. The scalar product of the normalized rate vectors significantly exceeded a random distribution for every night pair for 4/4 TLE and 3/5 ETLE patients with multiple nights and for all interval pairs for 3/4 TLE and 5/7 ETLE patients. When averaging over all intervals, the resected area included the HFO area for 10/11 patients.

Conclusion: While the intervals have to be selected carefully from slow wave sleep, the HFO analysis provided high reliability within and between nights for the individual patient.

Keywords: Epilepsy, HFO, ECoG, Monitoring

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P362 Automated diagnosis of temporal lobe epilepsy in the absence of interictal spikes—Ana Coito [1], Thibault Verhoeven [2], Gijs Plomp [3], Aljoscha Thomschewski [4], Francesca Pittau [5], Eugen Trinka [6], Roland Wiest [7], Karl Schaller [8], Christoph Michel [1], Margitta Seeck [9], Joni Dambre [2], Serge Vulliemoz [9,*], Pieter Van Mierlo [2] ([1] Functional Brain Mapping Lab, University of Geneva, Department of Fundamental Neuroscience, Geneva, Switzerland, [2] Ghent University, Department of Electronics and Information Systems, Ghent, Belgium, [3] Perceptual Networks Group, University of Fribourg, Department of Psychology, Fribourg, Switzerland, [4] Paracelsus Medical University and Center for Cognitive Neuroscience, Department of Neurology, Salzburg, Austria, [5] EEG and Epilepsy Unit, Neurology Clinic, University Hospital of Geneva, Geneva, Switzerland, [6] Paracelsus Medical University and Center for Cognitive Neuroscience, Department of Neurology, Salzburg, Austria, [7] Institute for Diagnostic and Interventional Neuroradiology, University of Bern, Bern, Switzerland, [8] Neurosurgery Clinic, University Hospital Geneva, Geneva, Geneva, Switzerland, [9] EEG and Epilepsy Unit, Department of Neurology, Geneva, Switzerland)

Objective: To diagnose and lateralise Temporal Lobe Epilepsy (TLE) by building a classification system that uses directed functional connectivity patterns estimated during EEG periods without visible pathological activity.

Methods: Resting-state high-density EEG recording data from 20 left TLE patients, 20 right TLE patients and 35 healthy controls was used. Epochs without interictal spikes were selected. The cortical source activity was obtained for 82 regions of interest and whole-brain directed functional connectivity was estimated in the theta, alpha and beta frequency bands. These connectivity values were then used to build a classification system based on two two-class Random Forests classifiers: TLE vs healthy controls and left vs right TLE. Feature selection and classifier training were done in a leave-one-out procedure to compute the mean classification accuracy.

Results: The diagnosis and lateralization classifiers achieved a high accuracy (90.7% and 90.0% respectively), sensitivity (95.0% and 90.0% respectively) and specificity (85.7% and 90.0% respectively). The most important features for diagnosis were the outflows from left and right medial temporal lobe, and for lateralization the right anterior cingulate cortex. The interaction between features was important to achieve correct classification.

Conclusions: This is the first study to automatically diagnose and lateralise TLE based on EEG. The high accuracy achieved demonstrates the potential of directed functional connectivity estimated from EEG periods without visible pathological activity for helping in the diagnosis and lateralization of TLE.

Keywords: EEG, Temporal lobe epilepsy, Classification, Directed functional connectivity, Diagnosis

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P363 Neurophysiologic alterations and effects of DRD2 gene polymorphism in burning mouth syndrome—Marina Kolkka-Palomaa [1], Heli Forssell [1], Arja Virtanen [2], Antti Puhakka [2], Ullamari Pesonen [2], Satu Jääskeläinen [2,*] ([1] Turku University Hospital, Oral diseases, Turku, Finland, [2] Turku University Hospital, Department of Clinical Neurophysiology, Turku, Finland)

Background and aims: Neuropathic mechanisms are involved in burning mouth syndrome (BMS), and variation of dopamine D2 receptor (DRD2) gene may contribute to pain perception. We investigated whether the neurophysiologic findings differ in BMS patients compared with healthy controls, and whether 957C > T polymorphism of the DRD2 gene influences perception or interference of pain in daily life in BMS.

Methods: 45 BMS patients (43 women, mean age 62.5 years) and 32 healthy controls (30 women, mean age 64.8 years) participated. Patients estimated pain intensity, suffering, quality of life (QoL) and sleep with NRS. Blink reflex (BR) of the supraorbital (SON), mental (MN) and lingual (LN) nerves and thermal quantitative sensory testing were done. The results were analysed with ANOVA. DRD2 gene 957C > T polymorphism was determined in 31 patients and its effects on neurophysiologic and clinical variables analysed.

Results: Cool ($p = 0.0090$) and warm detection thresholds ($p = 0.0229$) were higher in BMS patients than controls. The stimulation threshold for SON BR was higher in patients than in controls ($p = 0.0056$). The latencies of R2 component were longer in BMS patients than in controls ($p = 0.5$) at the SON distribution. Habituation of SON BR did not differ between the groups. The heat pain thresholds were highest ($p < 0.1$) in patients with 957TT genotype, and they also reported the lowest QoL, more suffering, and sleep disturbances ($p = 0.0254$–0.0352).

Conclusions: Thepatients showed thermal hypoesthesia within LN distribution compatible with small fibre neuropathy in BMS. The