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Neurological and psychiatric diseases I

ID 16 – Impulse control disorders in young-onset patients with Parkinson's disease: Cross-sectional study seeking associated factors with regard of personal characteristics—T. Gescheidt^{a,b}, V. Majerová^c, K. Menšíková^d, L. Dušek^e, K. Czekóová^{b,f}, P. Kotková^g, P. Kaňovský^d, J. Roth^c, M. Bareš^{a,b} (^aDepartment of Neurology, Medical Faculty Masaryk University and St. Anne's University Hospital, Brno, Czech Republic, ^bCEITEC – Central European Institute of Technology, Behavioural and Social Neuroscience Research Group, Masaryk University, Brno, Czech Republic, ^cDepartment of Neurology 1st Faculty of Medicine Charles University and General Teaching Hospital, Prague, Czech Republic, ^dDepartment of Neurology, Faculty of Medicine and Dentistry, Palacky University, University Hospital, Olomouc, Czech Republic, ^eInstitute of Biostatistics and Analysis, Masaryk University, Brno, Czech Republic, ^fInstitute of Psychology, Academy of Sciences of the Czech Republic, Brno, Czech Republic, ^gPsychiatric Hospital Kosmonosy, Czech Republic)

Introduction: The aim of cross-sectional study was to describe the frequency and associated factors of ICD in young-onset PD patients in specialized movement disorders centres in the Czech Republic (Prague, Brno and Olomouc).

Subjects and methods: 49 young-onset PD patients and 38 control subjects were examined. ICD were detected using South Oaks Gambling Screen and modified Minnesota Impulse Disorders Interview.

Results: Higher frequency of pathological gambling and hypersexuality was found in PD patients. Symptoms of any ICD were more frequent in patient group (13 patients (26.5%) / 4 controls (10.5%); n.s.).

Higher occurrence of pathological gambling was observed in young-onset PD patients using dopamine agonists and also in subjects with dyskinesias lasting 5 years or more. Occurrence of any ICD was associated with drinking a coffee, anxiety and higher score in the domain "somatization" of psychopathology screening questionnaire (The Symptom Checklist 90). ICDs were also related to personal characteristics of patients (using Personality Style and Disorder Inventory); there was higher score in a scale of style self-confident/dissocial and aloof/schizoid.

Conclusion: ICDs have to be considered as a real problem in young-onset PD patients; knowledge of associated factors may be helpful in proactive seeking for these pathological types of behaviour.

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ID 25 – Changes of cardiac autonomic nervous activity during a course of electroconvulsive therapy in depression—Y. Suzuki^a, M. Miyajima^a, K. Ohta^{a,b,c}, N. Yoshida^{a,d}, M. Okumura^e, M. Nakamura^f, T. Sasano^b, T. Kawara^g, M. Matsuura^b, E. Matsushima^a (^aSection of Liaison Psychiatry and Palliative Medicine, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Tokyo, Japan, ^bSection of Life Sciences and Biofunctional Informatics, Graduate School of Health Care Sciences, Tokyo Medical and Dental University, Tokyo, Japan, ^cPsychiatry, Onda-daini Hospital, Chiba, Japan, ^dPsychiatry, Nakano General Hospital, Tokyo, Japan, ^ePsychiatry, Oishi Kinen Hospital, Tokyo, Japan, ^fPsychiatry, Narimasu Kousei

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Objective: Seizure duration has been reported to decrease across a course of electroconvulsive therapy (ECT) (anticonvulsant effect). Because dynamic autonomic activity changes have been described during ECT, and are affected by seizure generalization, we examined the relationship between longitudinal autonomic nervous activity changes on a course of ECT and seizure duration.

Methods: Electroencephalograms (EEG) and electrocardiograms (ECG) of twelve depressive patients were recorded during ECT procedures. The mean heart rate (HR) in 30 s prior to stimulus onset was defined as baseline HR. The T_{Max} peak was designated as the data point with the maximum HR after stimulus onset. $T_{1/2}$ points were determined as the time point when HR was reduced midway between baseline HR and T_{Max} HR. The changes of EEG seizure duration, T_{Max} , and $T_{1/2}$ throughout the course of ECT, and their correlations, were examined.

Results: $T_{1/2}$ significantly decreased with repetition of ECT. $T_{1/2}$ was positively correlated to EEG seizure duration.

Conclusions: The time to return to the baseline from sympathetic nervous activation caused by ECT stimulation is shortened during a course of ECT.

Key message: Sympathetic nervous activity suppression and an anticonvulsant effect may contribute to the clinical action of ECT.

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ID 66 – Effect of a medical food on macroscopic brain activity in mild Alzheimer's disease: Results from an exploratory double blind, randomised controlled magnetoencephalography study—E.C.W. van Straaten^{a,c}, H. de Waal^b, M. Lansbergen^c, J. Sijben^c, Ph. Scheltens^b, F. Maestu^d, R. Nowak^e, P. Kamphuis^c, A. Hillebrand^a, C.J. Stam^a (^aDepartment of Clinical Neurophysiology and MEG Center, The Netherlands, ^bDepartment of Neurology and Alzheimer Center, VU University Medical Center, Amsterdam, The Netherlands, ^cNutricia Research, Utrecht, The Netherlands, ^dLaboratory of Cognitive and Computational Neuroscience (UCM-UPM), Center for Biomedical Technology, Madrid, Spain, ^eMagnetoencephalography Unit, Centro Medico Teknon, Barcelona, Spain)

Objective: The aim of the study was to explore the effect of a medical food intervention, developed to improve synaptic formation and function, on magnetoencephalography (MEG), as a proxy of macroscopic effects of synaptic changes, in patients with mild Alzheimer's disease (AD).

Methods: In an exploratory 24-weeks, double blind, randomised controlled sub-study of the Souvenir II study, differences between the active ($n = 22$) and control ($n = 27$) drug-naïve mild AD patients were computed for frequency analysis, functional connectivity and functional brain network measures in source space MEG.

Results: The groups were significantly different with respect to baseline mini-mental state examination (MMSE) (active: 23.8 ± 2.3 (mean $\pm$ SD); control 25.3 ± 2.6). No consistent statistically significant intervention effects were found on the MEG measures.

Conclusions: In the current subsample of mild AD patients we could not detect an intervention effect of the medical food on MEG measures as opposed to EEG that has been used in a larger sample and revealed beneficial intervention effects on functional connectivity and brain network organisation in mild AD.

Key message: Further research is needed with substantially larger sample sizes and better balanced study groups to further assess the role of MEG in intervention trials in AD.

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ID 94 – Clinically isolated syndrome (CIS): Measure of axonal status—V. Fernández, M.J. Postigo, A. Gonzalez, P. Urbaneja, A. León, A. Alonso, M. Guerrero, O. Fernández (A Instituto de Neurociencias Clínicas, Hospital Regional Universitario de Málaga “Carlos Haya”, Málaga, Spain)

Introduction: The clinically isolated syndrome (CIS) is a first episode of neurological symptoms caused by inflammation and demyelination in one or more sites in the central nervous system (CNS). CIS patients may develop multiple sclerosis (MS). Easy and reliable measures of CIS conversion to MS and measures of early axonal loss are lacking. Evoked potentials allow us the functional study of CNS. Visual (VEP) and motor evoked potentials (MEP) have already demonstrated good correlation with disability progression in MS. Optical coherence tomography (OCT) measures the retinal nerve fiber layer (RNFL) and macular ganglion cell layer thickness (GCL).

Objetives: Early quantification of axonal loss in CIS.

Material and methods: Prospective transversal study of 20 CIS patients with PEV, MEP and OCT (RNFL (μm); GCL (μm)).

Results: CIS were monofocal: 9 optic neuritis, 4 brainstem and 7 long pathways syndrome. PEV and PEM measures were also correlated between them. PEM amplitude ratio with compound motor action potential-CMAP, was the strongest measure correlated with MS conversion.

Discussion: We detected early axonal loss in patients with CIS. PEM measures are well correlated with OCT and clinical measures of neurodegeneration. PEM amplitude ratio was the strongest measure correlated with MS conversion and disability progression.

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ID 110 – Sensory-motor networks' topology in multiple sclerosis fatigue—F. Vecchio^a, F. Miraglia^a, C. Porcaro^b, C. Cottone^b, A. Cancelli^{b,c}, P.M. Rossini^{c,d}, F. Tecchio^{b,d} (^aBrain Connectivity Laboratory, IRCCS San Raffaele Pisana, Rome, Italy, ^bLaboratory of Electrophysiology for Translational neuroscience (LET'S) – ISTC – CNR, Department of Neuroscience, Fatebenefratelli Hospital, Rome, Italy, ^cInstitute of Neurology, Catholic University, Rome, Italy, ^dUnit of Neuroimaging, IRCCS San Raffaele Pisana, Rome, Italy)

The large majority (80%) of people with multiple sclerosis (MS) complain of fatigue, which is the most disabling symptom in half of them. While the few drugs used to treat MS fatigue are limitedly useful, it was recently observed the efficacy of a personalized neuromodulation treatment, supporting the concept that interventions modifying the sensorimotor network activity balances could be suitable non-pharmacological treatments for MS fatigue. Aim of the present study is to strengthen knowledge of the brain unbalances, which proper neuromodulations should target to compensate.

We collected electroencephalographic (EEG) data in 18 people with mild MS, while they were in resting state with open eyes. To ensure a wide range of fatigue, we enrolled patients to have Higher- or Lower-Fatigue based on scores of the modified Fatigue Impact Scale (mFIS). We selected the graph theory small-world index, calculated on networks of cortical nodes estimated by eLORETA, to evaluate the characteristics of left and right frontal (Motor) and parieto-occipital-temporal (Sensory) brain networks separately.

Fatigue symptoms increased together with the small-world index in the Sensory network of the left dominant hemisphere.

This finding hones understanding of the targets of neuromodulation interventions indicating the sensory network of the dominant left hemisphere as a specific target.

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ID 138 – Differentiation of attention network deficits in Mild Cognitive Impairment and Alzheimer's disease by means of auditory oddball fMRI responses—Moataz Assem^a, Meltem Hale Alpsan^b, Esin Karahan^a, Ali Bayram^c, Başar Bilgiç^{d,e}, Hakan Gürvit^{d,e}, Ahmet Ademoglu^{a,f}, Tamer Demiralp^{e,g} (^aInstitute of Biomedical Engineering, Bogazici University, Istanbul, Turkey, ^bAnadolu Saglik Group, Istanbul, Turkey, ^cFaculty of Engineering and Natural Sciences, Uskudar University, Istanbul, Turkey, ^dDepartment of Neurology, Istanbul Faculty of Medicine, Istanbul University, Istanbul, Turkey, ^eIstanbul University, Hulusi Behcet Life Sciences Research Laboratory, Capa-Istanbul, Turkey, ^fIstanbul Sehir University, Istanbul, Turkey, ^gDepartment of Physiology, Istanbul Faculty of Medicine, Istanbul University, Istanbul, Turkey)

Objective: To investigate the affection of widespread activations elicited by the auditory oddball paradigm in healthy elderly, Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD) in an event related fMRI study.

Methods: 5 controls, 6 MCI and 5 AD subjects participated. Paradigm consisted of standard (1000 Hz, 80%) and target (1500 Hz, 20%) stimuli (200 ms, mean ISI 2.2 s). BOLD images (TR = 2400 ms) and T1 anatomical scans were acquired with a 1.5 Tesla system. Standard preprocessing was applied using SPM8. General linear model design matrix included standard (single regressor), target stimuli (two regressors: correct and wrong responses), realignment parameters and time derivatives of hemodynamic function.

Results: Areas affected in MCI and AD relative to controls include dorsolateral and ventrolateral prefrontal, anterior cingulate, superior temporal, supramarginal, cuneus, fusiform and lingual gyri. Areas exclusively affected in AD include middle temporal, precuneus gyri, caudate, thalamic nuclei and posterior cingulate cortex.

Conclusions: Compared to MCI, AD shows progressive affection of attention related regions, especially those of the dorsal network. In addition, basal ganglia recruitment is only affected in AD.

Key message: fMRI responses to auditory oddball can serve as a potential imaging biomarker to differentiate between attention networks deficits in MCI and AD.

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