Method: 53 spinal cord injury and 6 multiple sclerosis patients with neurogenic detrusor overactivity requiring regular self-catheterisation, failing on oral anticholinergics were randomised to receive a single dose of BTX A (BOTOX® 200U or 300U) or placebo. Effects on maximum cystometric capacity (MCC), reflex detrusor volume (RDV) and maximum detrusor pressure during bladder contraction (MDP) were measured throughout 24 weeks post-treatment.
Results: Improvements in bladder management were observed in both BOTOX® groups. Significant increases ($p \leq 0.020$) in mean MCC and significant decreases ($p \leq 0.023$) in MDP from baseline were seen at all post-treatment timepoints. No such changes were observed with placebo. 23 patients experienced no RDV for at least 1 follow-up visit, 91% of whom were in a BTX A-treated group. For patients having a post-treatment RDV, significant increases ($p \leq 0.021$) from baseline were seen at weeks 6 (300U) and 24 (200U). No drug-related adverse events were reported. No patient was positive for neutralising antibodies at baseline or study end.
Conclusion: BOTOX® produced substantial improvements in urodynamics that suggest an increased ability of the bladder to hold and retain urine. BOTOX® may be an important therapeutic option for improving neurogenic bladder management and reducing risk of vesicoureteric reflux, potentially preventing upper urinary tract deterioration and kidney damage.

OPL141

Treatment of the chronic alien hand syndrome: compensating for loss of motor inhibition at the interface of planning and execution

Brainin, M. *Neurosciences Centre, Austria*

Background: The alien hand syndrome (AHS) is rare but extremely disabling because it interferes with everyday activities in a most unsettling and distressing way. No systematic exploration of the behavioural components has been performed and no treatment recommendations exist.
Method: Consecutive cases of chronic AHS were analysed during simulated daily activities according to a protocol and individual treatment options were developed aiming at compensating the loss of inhibitory motor behaviour.
Results: Eight stroke patients were included. All had lesions involving the anterior Corpus callosum as well as the upper frontomedial region. Two kinds of behavioural disturbance were predominant: either uncontrollable grasping and groping or a kind of counteracting which aimed at dissolving or disrupting the motor action being planned or performed. The latter we call "gegenarbeiten" (Counterworking), a more or less well-sequenced disruptive motor behaviour. Video-analysis showed spontaneously occurring avoidance behaviour such as hiding the affected hand or placing it at the far end of the table. For those cases such strategies were reinforced. Rhythmic behaviour could also interrupt the ongoing grasping of objects.
Conclusion: Therapy of the AHS focuses individually on the predominant type of interfering motor behaviour. This includes strategies to overcome forced grasping and groping with rhythmical and avoidance behaviour as well as limiting those counteracting and disruptive motor sequences ('gegenarbeiten') by fixating the interfering hand towards the body or placing it at the far side of the table.

OPL143

FMRI of the human sensorimotor cortex before and after post-stroke neurorehabilitative subsensory whole-hand afferent electrical stimulation

Golaszewski SM[1], Guendisch GM[2], Siedentopf CM[2], Koppelstaetter F[2], Verius M[2], Mottaghy FM[3], Felber SR[2], Gerstenbrand F[4]. [1]*Department of Neurology, Christian Doppler Klinik, Salzburg, Austria;* [2]*Department Of Neuroradiology, University Hospital Of Innsbruck, Innsbruck, Austria;* [3]*Department of Nuclear Medicine, University of Ulm, Germany;* [4]*Ludwig Boltzmann Institute for Restorative Neurology and Neuromodulation, Otto Wagner Hospital, Vienna, Austria*

Background: Stimulation of proprioceptive pathways using electrical stimulation with a mesh-glove showed improved motor performances of stroke patients with chronic neurological deficits. However these empirically proven beneficial effects were lacking any neurophysiological explanation.
Method: Ten healthy volunteers were studied using BOLD-fMRI with: 1. A test motor-task with finger-to-thumb tapping of the left hand, 2. a whole-hand afferent electrical mesh-glove-stimulation of the left hand below the sensory level for sensation for 30 minutes, 3. a second fMRI run with the same paradigm as in the test motor-task immediately after electrical stimulation and 4. a identical fMRI run 2 hours post-stimulation to test cortical changes induced by electrical stimulation. Experiments were executed on a 1.5 TESLA MR-scanner and data-analysis was performed with SPM99.
Results: Group-analysis of fMRI-data showed: 1. Baseline fMRI-examinations revealed brain activation of the primary and secondary sensorimotor cortex as previously described. 2. After electrical stimulation, an increase of activated pixels in the hand-areas could be detected. 3. Additionally however, activation of regions not visible in the baseline studies was noticed: ipsilateral inferior parietal lobule, pre- and postcentral gyrus and the superior parietal lobule. 4. Activations diminished to baseline-level 2 hours post stimulation.
Conclusion: FMRI-results indicate an increase in neuronal activity that may provide augmented neuronal excitability and augmented local-field-potentials within the sensorimotor cortex which can be successfully influenced by subsensory stimulation of afferent pathways. These neuromodulatory effects hold promise for a therapeutic potential of mesh-glove in neurorehabilitation of patients with impaired motor hand functions after stroke.

OPL144

FMRI Mapping of the sensorimotor cortex of the foot by vibrotactile stimulation

Gerstenbrand, F[1], Siedentopf, C[2,3], Koppelstaetter, F[2,3], Guendisch, G[3], Gallasch, E[4], Ischebeck, A[3], Felber, S[2], Golaszewski, S[2,3,5]. [1]*Ludwig Boltzmann Institute for Restorative Neurology and Neuromodulation, Vienna, Austria;* [2]*Department of Neuroradiology, Medical University Innsbruck, Austria;* [3]*fMRI Lab, Department of Psychiatry, Medical University Innsbruck, Austria;* [4]*Department of Physiology, Medical University Graz, Austria;* [5]*St. Mauritius Clinic and Neurological Therapy Center, Heinrich Heine University Düsseldorf, Germany*

Purpose: The aim of the study was the development of a paradigm for the mapping of the sensorimotor foot region in functional magnetic resonance imaging (fMRI) with vibrotactile stimulation. Therefore, a proper vibrotactile stimulus was developed and the elicited brain activation pattern was analyzed to find best vibration parameters and an optimized experimental protocol for the applicability of the developed paradigm in clinical functional diagnosis of the brain.
Methods: 10 healthy male subjects (25–45yrs) were stimulated with a vibrotactile stimulus within the arch of the right foot. The stimulus was delivered through a fully automated moving magnet actuator with frequency (0-100Hz) and amplitude (0-4mm) control. To avoid adaptation phenomena a stimulus wave form was formed as the product of a fixed vibration carrier signal and a modulation term which varied sinusoidally. The carrier frequency was held constant at 100 Hz at a fixed modulation frequency of 25Hz and a fixed stimulus intensity of 0.05N throughout the fMRI run.

Experiments were performed on a 1.5Tesla MR-scanner. For fMRI, we employed T2*-weighted single shot echoplanar sequences (TR/TE/α = 0, 96ms/66ms/90°, matrix = 64×64, acquisition time: 2sec, voxel dimension = 4×4×4mm). Twenty-four slices parallel to the bicommissural plane were simultaneously acquired in an event related

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