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Presentation Abstract

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Presentation Title: Integration of sensory force feedback is disturbed in CRPS-related dystonia

Location: Hall F-J

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Abstract: Complex regional pain syndrome (CRPS) is characterized by pain and disturbed blood flow, temperature regulation and motor control. Approximately 25% of cases develop fixed dystonia, a movement disorder of sustained muscle contraction and abnormal postures. The origin of fixed dystonia is poorly understood, yet recent insights involve disturbed force feedback. Assessment of sensorimotor integration may provide insight into the pathophysiology of fixed dystonia. Sensory weighting is the process of integrating and weighting sensory feedback channels in the central nervous system. Position and force are physically related, allowing translation from one modality into the other. When stiffness is known, combining the sensory feedback of position and force (sensory integration) provides increased accuracy of the estimate of either modality. It was hypothesized that patients with CRPS-related dystonia bias sensory weighting of force and position toward position due to the unreliability of force feedback.

CRPS-patients with dystonia (n=10) and age and gender-matched healthy subjects blindly reproduced a trained force against a linear spring which on occasion was covertly replaced by a non-linear spring, revealing the sensory weighting between force and position feedback (Mugge et al. 2009).

The current study provides experimental evidence for dysfunctional sensory integration in fixed dystonia, showing that CRPS-patients with fixed dystonia do not reweight force and position feedback as controls do.

The study shows that patients always favor position feedback, making it the first to demonstrate disturbed integration of force feedback in fixed dystonia, an important step towards understanding the pathophysiology of fixed dystonia.

References

Mugge W, Schuurmans J, Schouten AC, van der Helm FC. Sensory weighting of force and position feedback in human motor control tasks. J Neurosci 2009 29(17):5476-82.

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SENSORIMOTOR

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