

PROPRIOCEPTIVE DISTURBANCES IN RSI: A COMPARISON WITH CRPS

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INTRODUCTION

Repetitive Strain Injury (RSI) is a syndrome causing sickness absenteeism all over the world. An often reported symptom of RSI is dystonia, in which there are strong indications for the presence of proprioceptive disturbances. Since RSI is sharing a clinical spectrum along with Complex Regional Pain Syndrome (CRPS), it has been suggested that chronic RSI and CRPS might be related. Chronic RSI might be maintained as the consequence of sensory and proprioceptive disturbances, resulting in co-contraction, tremor, or disturbed proprioceptive response. RSI patients suffering from dystonia may show comparable deficits in performance as CRPS patients. To evaluate the existence of tremors, or deviating force control in patients with chronic RSI, RSI and CRPS patients and controls performed a bradykinesia experiment and a force-control task. We hypothesized that RSI patients would perform worse than controls, but still better than patients with CRPS.

METHODS

Nine RSI patients, 5 CRPS patients and 10 healthy subjects participated. Six RSI patients and all CRPS patients were diagnosed as having dystonia. All subjects filled in the Disabilities of Arm, Shoulder and Neck (DASH) questionnaire and the Shoulder Pain questionnaire.

In the bradykinesia test subjects were asked to open and close their thumb and index finger, as wide and as fast as possible for a period of 30 seconds. From recordings we derived the Total reached distance (TRD), root mean square (RMS) and median frequency (MF), for both the full 30 seconds and three consecutive 10-s intervals.

The force-control task was administered with a handle, positioned in front of the subject. Subjects were sitting with their arm in zero degrees elevation, the elbow in 90° flexion and pronation. Subjects were asked to follow a tracing signal on a computer screen that indicated the required force level. Applied force was plotted on-line (Figure 2). During the task EMG of two shoulder flexors and extensors was recorded. Mean Absolute Amplitude (MAA), transition time (TT) and muscle co-activity were analyzed.

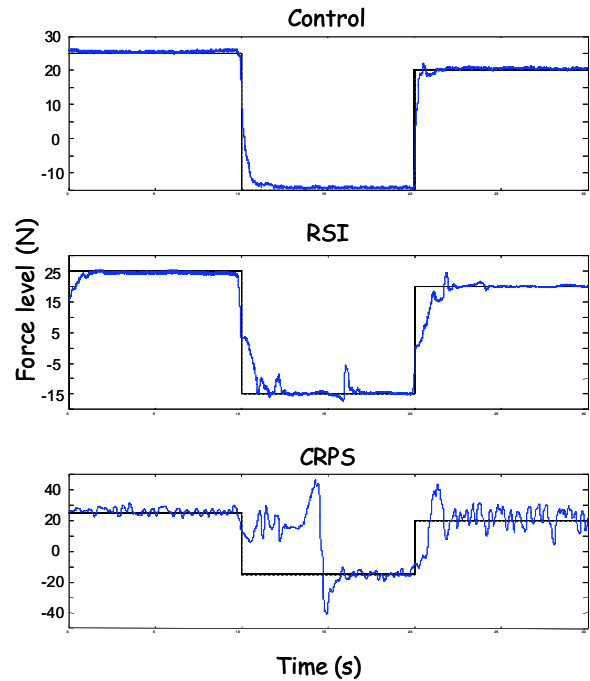


Figure 2
 Typical examples of results for the force-control task. Top: Differences between groups were determined using ANOVA and a Bonferroni post-hoc evaluation.

RESULTS AND DISCUSSION

CRPS patients performed the bradykinesia experiment with a lower MF and a shorter TRD than RSI patients and controls (Figure 1). No significant differences were found between RSI and controls. The median frequency dropped marginally over the three 10-s periods, but not different for the three groups. Force-control parameters were not different between subjects with RSI and controls, but CRPS patients did show significantly shorter TT and a higher MAA (Figure 2). RSI patients and CRPS patients show not show a higher co-activation in the shoulder muscles than controls.

CONCLUSIONS

On the basis of the bradykinesia- and force-control test, it could not be concluded that RSI patients had proprioceptive disturbances. As such, these results could not support the theory by Johansson et al. (1) related to the development of RSI could not yet be supported. Evaluation of co-a

REFERENCES

1. Johansson, H & Sojka, P, 1991. Medical Hypothesis, 35: 196-203.

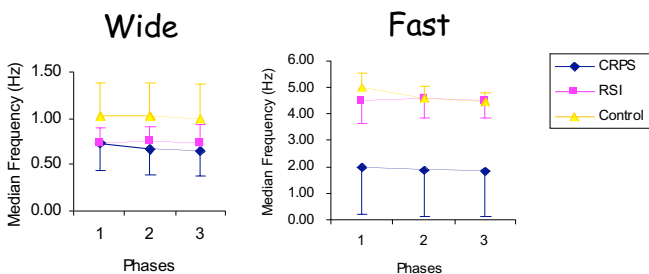


Figure 1
 Median frequencies as measured in the bradykinesia test. Phases indicate following 10-second windows during the 30-s test.