ABSTRACT

Purpose and relevance

Focal hand dystonia (FHD) in musicians is a painless task-specific motor disorder characterized by involuntary loss of control of individual finger movements. It is associated with decreased cortical inhibition, and maladaptive cortical reorganization showing fusion of the representational zones of the digits in the primary somatosensory cortex. The aim of this study was to investigate the long-term effects of a combined behavioral therapy intervention, aimed at normalizing finger movement patterns.

Methods

Eight musicians with FHD volunteered to take part. One year of intensive constraint-induced therapy and motor control retraining at slow speed were the interventions. A quasi-experimental repeated measures (within-subject) design was used, with 9 testing sessions over 4 years. Video recordings of the subjects playing two pieces were used for data analysis. The Frequency of Abnormal Movements scale (FAM) was the main outcome measure. It was hypothesized that there would be significant differences in FAM scores achieved over the 4-year period.

Results

The results from the two-factor repeated measures ANOVA revealed that the mean number of abnormal movements per second of instrumental playing decreased significantly by approximately 80% for both pieces over the 4-year period ($F = 7.85$, $df = 8$, $p < 0.001$). Tukey's post-hoc test revealed that statistically significant improvements occurred after 6 months of therapy (p-values between $p < 0.001$ and $p = 0.044$). Although the results were not significant between month 12 and follow-up at year 4, the trend revealed that the progress achieved during the first year of intensive retraining was maintained at year 4.

Conclusions and implications

A 1-year period of intensive task-specific retraining may be a successful long-term strategy for the treatment of musicians' FHD. Results suggest that retraining strategies may need to be carried out for at least 6 months before statistically significant changes are noted.

Keywords

Focal dystonia; motor control; cortical plasticity.

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