A MOTION CONTROL FUNCTION EVALUATION SYSTEM EMPLOYING A PEN TABLET

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INTRODUCTION

The arm and hand movement functions are evaluated by many various tests, such as the electromyogram, Jebsen hand function test, finger function quotient, arm function test, manual function test and the motor age test. The electromyograms are recorded from biceps brachii muscle and triceps brachii muscle during ballistic movement simultaneously. The phase relation between the electromyograms enables the estimation of the arm movement function. The other tests evaluate function by movements of grasping small objects, turning over cards, moving the hand to the back and touching the hand to the head. These tests are very important in the evaluations of disease states, and early detection can reduce the symptoms and/or delay the further progression of the disease.

RESULTS

The total tapping time during 50 taps (plot a), the tapping period between each two successive tapped positions (plot b), the absolute distance moved between each two successive tap positions (plot c), the total distance moved during 50 taps (plot d). (a) and (b) show there were not significant differences between the cerebral infarction subjects and the normal subjects. (c) shows the cerebral infarction subject's right hands was 220% greater than with their left hands. In normal subjects, both hands were almost identical and also in approximately 30% of the cerebral infarction subject's right hands. (d) shows the cerebral infarction subject's right hands was 230% greater than their left hands, and 370% greater than the normal subjects.

CONCLUSION

The tablet based system was developed for evaluation of hand motion control function as it might be influenced by brain disease. The system can quantitatively evaluate hand motion control function in certain patients by measurement of total moved distance and absolute distance moved.

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