Reliability of Nicholas Hand-Held Dynamometer of Muscle Strength Measurement in Children with Cerebral Palsy and Non-Disabled Children

Ai-Wen Hwang Hua-Fang Liao* Ar-Tyan Hsu** Sue-Mae Gan*** Chia-Rong Lee****

Purpose: Muscle strength plays an important role in the motor function of children with cerebral palsy (CP). The information about the prerequisites for muscle strength measurement methods, validity and reliability, however, are lacking in children with CP. The purpose of this study, therefore, was to examine the reliability of muscle strength measurement with a Nicholas Manual Muscle Tester (NMMT) in children with CP and non-disabled (ND) children. Subjects: Twenty children with spastic CP and 30 ND children ages 6 to 12 years participated. Methods: The intrasession, intersession, and interrater reliability were analyzed with intraclass correlation coefficient (ICC (2,1)) for 12 muscle groups. Results: The intrasession reliability was good (ICC=0.83-0.98) in both groups. The intersession reliability was good in ND children (ICC=0.75-0.98), and moderate to good in children with CP (ICC=0.60-0.94), except for the elbow extensors and hip adductors. The interrater reliability was moderate to good in both groups (ICC=0.62-0.97), except for the shoulder abductors and extensors, elbow extensors and hip extensors in children with CP. Conclusion: The NMMT is reliable in testing muscle strength of non-disabled children and children with CP. (FJPT 2002;27(2):69-82)

Key Words: Muscle strength, Reliability, Children, Cerebral Palsy, Dynamometer

Muscle weakness is one of the major causes of movement dysfunction in children with cerebral palsy (CP).1 Recently, strength training programs has been frequently recommended for treating children with CP.2-6 In children with CP, the strength of the lower limbs appears to correlate with their motor function.7-9 The effect of muscle strengthening for improving functions remains controversial.5-7 To be effective, the strengthening program should be prescribed according to the results of evaluation. Damiano suggested that the two weakest muscles should be chosen as the target

T'aipei The First Children's Development Center
* School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University
** A-T Hsu, Department of Physical Therapy, College of Medicine, National Cheng Kung University
*** Chung-Shan Medical University Rehabilitation Hospital
**** Chia-Yi School for Mentally Retarded
Correspondence to: Hua-Fang Liao, School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University, 7 Chun-Shan S. Rd., Taipei 100, Taiwan, R.O.C. TEL: 886-2-23123456-6737
E-mail: hfliao@ccms.ntu.edu.tw
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