The Relations between Body Composition and Muscle Strength of Lower Extremities in Independent Walkers with Spastic Diplegic Cerebral Palsy and Non-Disabled Children

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Background and Purposes: Children with cerebral palsy (CP) often have health-related problems. Muscle strength and body composition are two components of fitness. The related studies are few. The purposes of this study were: to compare the body composition and muscle strength between children with cerebral palsy and non-disabled children and to investigate the relations between lean body mass and loaded sit-to-stand capacity. Methods: This was a prospective relations analysis study. Six to 12 year-old children were recruited, including 26 children with spastic diplegia (mean age 98 ± 22 mo.) who were able to walk independently and 60 non-disabled children (mean age 105 ± 19 mo.). The data from skinfold measurements were used to calculate the body fat percentage and lean body mass (LBM). The loaded sit-to-stand capacity, which represented the strength of extensors of the low extremities, was tested by loaded sit-to-stand test to obtain 1 maximum repetition (STS-1RM). The independent t test was used to compare the values between two groups, and the linear regression model was used to test the correlation between two variables, such as lean body mass with strength, body mass index with body fat percentage. Fisher's Z transformation was used to test the differences between two correlations. Results: The LBM and STS-1RM was less in children with CP than in the non-disabled children, however, the body fat percentage and body mass index were not significantly different between the two groups. There were high correlations between the LBM and STS-1RM, and the correlation coefficients were not significantly different between children with CP and non-disabled children. The correlation coefficients between the LBM and STS-1RM for children with different functional groups of CP were different significantly. Conclusions: The children with CP of independent walker have similar body fat percentage and body mass index, less LBM and STS-1RM compared to non-disabled children. The LBM and STS-1RM were highly correlated in both groups. However, the correlations between LBM and STS-1RM were different in different functional groups of children with CP. Further study for the problem of fitness should consider the functional level for children with CP. (FJPT 2002;27(6):273-282)

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