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Leg extensor muscle strength during bilateral and unilateral contractions in children with cerebral palsy and without disabilities


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The aim of the present study was to compare voluntary isometric force production capacity of the leg extensor muscles during bilateral and unilateral contractions in children with spastic diplegic cerebral palsy (CP) and in children without disabilities. Thirteen 6-year-old children with mild-to-moderate spastic diplegic CP and 13 age- and gender-matched healthy children participated in this study. During the measurements the subjects were seated on a specially designed dynamometric chair with knee and hip angles equal to 110° and 120°, respectively. The isometric maximal force of the leg extensor muscles during bilateral contraction and the maximal force during bilateral contraction relative to body mass were lower ($P < 0.05$) in children with spastic diplegic CP than in children without disabilities (34.6% and 30.7%, respectively). Children with spastic diplegic CP had also lower ($P < 0.05$) isometric maximal force for right and left leg during unilateral contraction (29.8% and 36.9%, respectively) as compared to the controls. A marked bilateral strength deficit of the leg extensor muscles was observed in children with spastic diplegic CP and controls (25.5% and 22.0%, respectively), while significant difference between these groups was not observed ($P > 0.05$). Correlation analysis indicated that bilateral strength deficit is most obvious in spastic diplegic children with considerably decreased maximal and body mass-related isometric voluntary force-generating capacity of the leg extensor muscles during bilateral contraction.

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