

Poster presentation

Open Access

Exercise tolerance, level of physical activity and muscle strength in independent ambulators with Sacral Myelomeningocele

MAGC Schoenmakers*, PJM Helders, JW Gorter and T Takken

Address: Division of Pediatrics, Dept. Pediatric Physiotherapy and Exercise Physiology, University Children's Hospital and Medical Center, Room KB 02.056.0, POBox 85090, 3508 AB UTRECHT, The NETHERLANDS

Email: MAGC Schoenmakers* - m.a.g.c.schoenmakers@umcutrecht.nl

* Corresponding author

from 49th Annual Meeting of the Society for Research into Hydrocephalus and Spina Bifida
Barcelona, Spain, 29 June – 2 July 2005

Published: 30 December 2005

Cerebrospinal Fluid Research 2005, **2**(Suppl 1):S49 doi:10.1186/1743-8454-2-S1-S49

Background

In previous studies we investigated functional outcome in children with sacral level (lipo)myelomeningocele. Although 89% of them were community or normal walkers, most (90%) of them had balance problems, such as hopping into squares, jumping and standing on one leg. This might interfere with regular sporting activities, which are often limited in these children.

In this study we want to investigate the causal link between muscle strength, balance problems, endurance, level of everyday and sporting activities, and self-perceived motor competence in two groups of ambulant children with lumbosacral level paralysis: myelomeningocele (MMC) versus lipomyelomeningocele (LMMC)

Materials and methods

Currently (from February to April 2005) a cross-sectional study is carried out at the Spina Bifida outpatient clinic from the University Medical Hospital Utrecht. Thirty three children met the inclusion criteria (lesion level below L4, IQ > 80, aged between 6-18 years, being able to ambulate for 500 metres or more).

Muscle strength is measured with a hand-held myometer in upper and lower extremities in the following muscle groups: shoulder abductors, wrist extensors, grip strength, hip flexors, hip abductors, knee extensors, knee flexors, ankle dorsiflexors and calf muscles. Endurance is measured with the 6 minute walking test. The patients are instructed to walk at their own chosen walking speed from one side of the corridor to the other, turn and walk back. The total distance covered in 6 minutes is calculated. Exercise capacity is measured using a maximal exercise test on

a treadmill ergometer and an expired gas analysis system (VO₂ peak). The level of everyday physical activity is measured with a diary. Self-perceived motor competence is measured with the Dutch adaptation of the Harter Self-Perception Profile for Children. Data are analysed using independent samples T-tests.

Results

Currently we are collecting all data and the results will be discussed. A sample of 17 children with MMC and 6 children with LMMC are willing to participate in the study. Their mean age (SD) is 10.3 (3.3) and 10.6 (3.1) years respectively. All results will be corrected for known confounders such as age, gender, body mass index, body fat. The results will be compared with reference values of the normal population. In addition, we will compare the outcome in children with myelomeningocele with associated hydrocephalus and Chiari II malformation, with that of those with lipomyelomeningocele, without those associated central nervous system abnormalities. Causal relations between muscle strength, the level of everyday physical activity, endurance and self-perceived motor competence, will be calculated.