

An investigation of whether gross motor function, joint mobility and spasticity in the lower limbs of children with CP can be affected by using the “Innowalk” motorised training and stimulation aid.

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Background to the project

Physiotherapy treatment for children with cerebral palsy who have impaired or no walking function is increasingly being combined with motorised training and stimulation aids. The aim of these is to stimulate and improve the child's activity level, body structure and body functions. An increasing number of children with cerebral palsy in Norway have been given the Innowalk training and stimulation aid, which, among other things, is supposed to affect joint mobility and prevent painful spasticity.

Purpose and approach

To investigate whether gross motor function, joint mobility and spasticity in the lower limbs of children with cerebral palsy can be affected by using the Innowalk motorised training and stimulation aid.

Material and method

The study uses quantitative approximation and a single-subject design. The sample is strategic and comprises two children with cerebral palsy (GMFCS levels 3 and 5). Observation and testing were carried out before and after the intervention in collaboration with the children's local municipal physiotherapists in familiar surroundings. During the intervention period, the children used Innowalk daily for 9 and 12 weeks respectively. Gross motor function was assessed using the GMFM-66 test, spasticity was measured using a modified Ashworth scale and joint mobility in the lower limbs was measured with a goniometer.

Results

“Child 1” showed an improvement on one dimension of GMFM-66. Joint mobility showed a clinically significant change measured at 2 SD on three joint measurements: dorsal flexion of the right ankle with knee extended, outward rotation of the right hip and inward rotation of the left hip. “Child 2” showed an improvement on two dimensions of GMFM-66 and had three joint measurements that showed a clinically significant change measured at 2 SD: popliteal angle of the right knee, dorsal flexion of the right ankle with knee extended and inward rotation of the right hip.

The study did not demonstrate any clinically significant change in spasticity in either child.

Conclusion

The approach of the study was to investigate how gross motor function, joint mobility and spasticity in the lower limbs of a child with CP can be affected by using a motorised training and stimulation aid. As the study involved only a small number of participants (N=2), it is not possible to generalise the results. However, the study does tell us something about a potential effect and trend after intervention for the two children who took part, and may serve as a pilot for a subsequent larger study involving more participants.

The results from GMFM-66 and measurement of joint mobility show that it is possible to achieve a positive change in both gross motor function and joint mobility using the aid in question. Where spasticity is concerned, the present study has not demonstrated any change, although it has been shown that 30 minutes of standing activity daily could affect spasticity (Stevenson, 2010; Kheder & Nair, 2012). A child with GMFCS level 5 is at risk of developing contractures and pain, and the effect of the aid could be of great significance in terms of contracture prophylaxis. Good range of movement can also reduce the risk of dislocation of joints and surgical procedures as a result of the aforementioned contractures. It is likely that a child with GMFCS level 3 could achieve a certain walking function using aids. In order to optimise walking function, it is important to have good range of movement in the joints in the lower limbs, as well as muscle strength and trunk control, which will affect the child's balance and opportunity of independent movement.

Keywords: Cerebral palsy, child, joint mobility, ROM, gross motor function, spasticity, "Innowalk" motorised training and stimulation aid.