

Effect of vibration training and functional therapeutic muscle training on muscle function and activities of daily living in children with MMC



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1 Conclusion

The Cologne rehabilitation programme seems to improve motor function in children with Meningomyelocele (MMC). The results of the GMFM especially shows positive effects, for example in body balance, walking distance, sitting or standing ability. This auspicious motor development can improve quality of life of the children and their parents while transferred in daily living. Beside these results, WBV is a save training method for children with MMC.

2 Introduction

Meningomyelocele (MMC) is a hereditary dysraphic disorder which leads to pareses and severe impairments in motor functions. The degree of disablement is depending on the localization of the destruction of the spinal cord and of the utilization of the remaining muscles. Most of the children become wheelchair dependent during childhood. As a consequence they are also affected by the problems of longterm immobilisation like osteoporosis, contractures and further loss of muscle power. As result many of them need support in activities of daily living.

3 Objective

We analysed the results of children with MMC who participated in a new functional orientated rehabilitation programme. All children had severe impairments of their motor functions and most of them were wheelchair bound at least for longer distances.

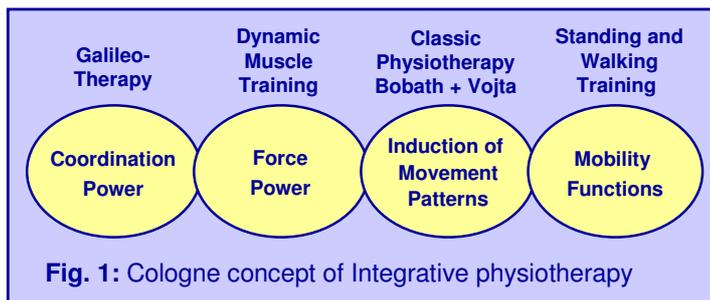
4 Intervention

The patients completed the 6 months rehabilitation programme at the medifitreha in Cologne. This concept includes 3 weeks of intensive physiotherapy (splitted into a start period of 2 weeks and a refresher course of 1 week after 3 months) and of 6 months Whole body vibration (WBV) therapy at home. During the time at the rehabilitation center the patients receive 4h of functional physiotherapy per day. A combination of physiotherapy (NDT), therapeutic strength training, pool-therapy, treadmill-training and Whole Body Vibration (side alternating vibration platform Galileo) is used to improve muscle function and independence in activities of daily living.

Literature: Preliminary results on the mobility after whole body vibration in immobilized children and adolescents

Semler O, Fricke O, Vezyroglou K, Stark C, Schoenau E
J Musculoskelet Neuronal Interact. 2007 Jan-Mar;7(1):77-81

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5 Patients and Results

16 patients were included in this analysis (8 = male; 8 = female; age 4-20 years). 12 of them had a VP-shunt due to hydrocephalus. The success of therapy was measured with DXA scans (GE Lunar Prodigy), with a ground reaction platform (Leonardo Tilt Table; novotec-medical, Pforzheim) and with a modified version of the Gross motor function measurement (GMFM).

Parameter	Changes
Tilt Table max Force at start and after 3 months [kN]	18.8 %
BMC legs/leg length at start and after 6 months [g]	10.1 %
Muscle mass legs/leg length at start and after 6 months [g]	1.0 %
GMFM at start and after 6 months [points]	4.0 %

Tab. 1: Mean changes during 6 months of training

6 Discussion

The Cologne rehabilitation concept led to an increase of musculo-skeletal parameters and to an improvement of motor functions. As consequence the patients should be able to gain more independency and will benefit from a higher quality of life. The training, which includes 6 months of WBV-therapy was a safe method for our patients and we have not seen any problems regarding VP-Shunts.

Further studies with more patients have to evaluate the effects regarding localisation of spinal cord injury, age, and degree of contractures.