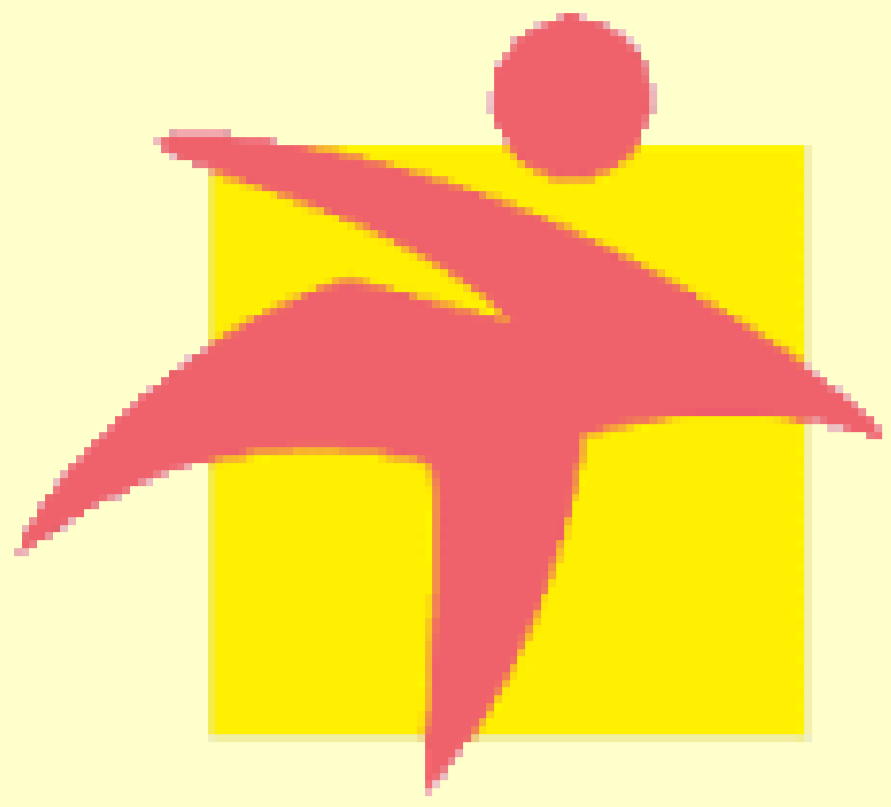


Which factors influence the outcome of Baby-CIMT?

Four case studies of infants younger than 12 months with clinical signs of unilateral spastic cerebral palsy (USCP) at the Z.E.N. in Biel, Switzerland.

Grosjean, A., Scheck, M., Schneider, Y., Schüle, S., Duetz Schmucki, M., Hassink, R.I.



Z.E.N.

Center of Developmental Advancement and Pediatric Neurorehabilitation of the Wildermeth Fondation
Kloosweg 22, 2502 Biel, Switzerland

www.zen-biel.ch

Introduction

Since the beginning of 2017 Baby-CIMT has been implemented at the Z.E.N. Unilateral brain lesions often lead to the development of a unilateral spastic cerebral palsy (USCP) causing limitations of functional motor abilities. The experience-based guidelines for Baby-CIMT from the Karolinska Institute of Sweden have been developed for treating infants below one year of age at risk of developing USCP. Several scientific studies have examined the efficacy of the Constraint-induced therapy (CIMT). The aim of this study is to compare the results of four treatments of Baby-CIMT, each with its own therapy-frequency and intensity.

Method

Participants:

Four infants, aged 5 to 12 months at the beginning of the treatment, all at risk of developing a USCP.

Study Design:

Four single Case Design with pre-, peri- and post structured observations.

Goals of the Baby-CIMT:

Increase the amount and quality of hand use (avoid non-use)

Home Program:

Duration: 6 weeks, 2 times for 30 min per day
Task: Play / explore with toys to stimulate the use of the affected hand

Assessment:

Tonus observations (based on Modified Ashworth Scale) and structured observations (based on Hand Assessment for Infant, HAI)

Results

All children improved the quality of their hand function and bimanual use during the training period. The identified factors that influenced the outcome can be allocated to the following groups: the severity of the diagnosis, the collaboration with the parents, their expectation, resources and attitudes, the acceptance of this treatment by the child as well as the child's interest in toys. These different aspects had all an impact on the dosage and intensity with which the therapy could be accomplished.

References:

Eliasson, A. C., Sjöstrand, L. (2017). Baby-CIMT Manual. [PDF] https://ki.se/sites/default/files/baby-cimt_manual_20151125.pdf
Eliasson, A. C., Nordstrand, L., Ek, L., Lennartsson, F., Sjöstrand, L., Tedroff, K. & Krumlinde-Sundholm, L. (2018). The effectiveness of Baby-CIMT in infants younger than 12 months with clinical signs of unilateral-cerebral palsy; an explorative study with randomized design. *Research in Developmental Disabilities*, 72, 191-201. doi : <https://doi.org/10.1016/j.ridd.2017.11.006>

Results - Data

	Diagnosis	Individual factors	Outcome
Case 1 (boy, 5 months*)	Motor deficit left upper extremity after premature birth (27 ^{5/7} GA)	- Severity of the disease - Compliance and motivation of parents ↗ - Acceptance of treatment by child ↗ - Fears concerning adverse effects ↘ - Family setting and time resources of parents ↓	
Case 2 (boy, 7 months*)	Motor deficit left upper extremity after premature birth (26 ^{5/7} GA)	- Severity of the disease - Time resources of the parents ↓ - Family setting ↘ - Acceptance of treatment by child ↑ - interest and determination of parents ↑	
Case 3 (girl, 9 months*)	After infarction of middle cerebral artery	- Severity of the disease - Resources and motivation of parents ↑ - Fear of frustrating the child ↘ - Acceptance of treatment by child ↘ - Presence of brother during the therapy ↘ - Poor interdisciplinary collaboration ↘	
Case 4 (girl, 12 months*)	Asymmetric (right > left) spastic tetraplegia after premature birth (35 ^{0/7} GA) and stroke during cardiac surgery at age 2 months	- Severity of the disease - Motivation of parents ↑ - Fluctuant time resources and limited compliance of parents ↘ - Age at the beginning ↘ - Opposition and poor interest in toys of child ↘ - Family setting, twin ↘	

Figure 1 Table of results diagram of development results
*at the beginning of the treatment

Discussion

Our results show positive effects of Baby-CIMT in children at risk of developing a USCP on the use of the affected hand, confirming findings of an earlier study with randomized design (2). We could identify some of the factors influencing the outcome of the Baby-CIMT. The limitations of the study include the small number of participants, the absence of control group and the qualitative design. Further studies could evaluate more objectively the effect of the parents' sense of competence on the outcome of the therapy.

Conclusion

Our study shows that Baby-CIMT can improve the quality of hand use in children at risk of developing a USCP. The outcome of the intervention is influenced by different individual factors. Further studies with quantitative design are necessary to bring more evidence in this domain of treatment.