

## Background

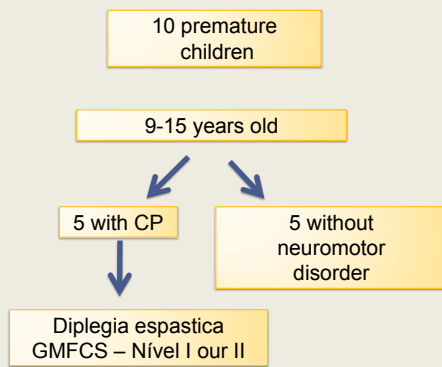
Premature infants often presents a different CNS structure and maturity, that frequently has influence on postural control (PC), and prematurity is also a risk factor for spastic diplegic cerebral palsy (CP). The movement sequence from sitting to standing (STS), being one of motor learning tasks that requires PC at the level of the ankle, seems to be a functional task often compromised in premature infants with and without CP.

## Aim(s)

Describe the behavior of the ankle muscles, anterior tibialis (TA) and soleus (SOL), with respect to the activation timing, magnitude and muscle co-activation during phase 1 and early phase 2 of STS sequence, performed by five premature children with spastic diplegic and five premature children without a diagnosis of neuromotor changes. This parameters were also studied, in the first group, after a 3 months intervention program based on the principles of the Bobath concept - Neurodevelopment Treatment (NDT).

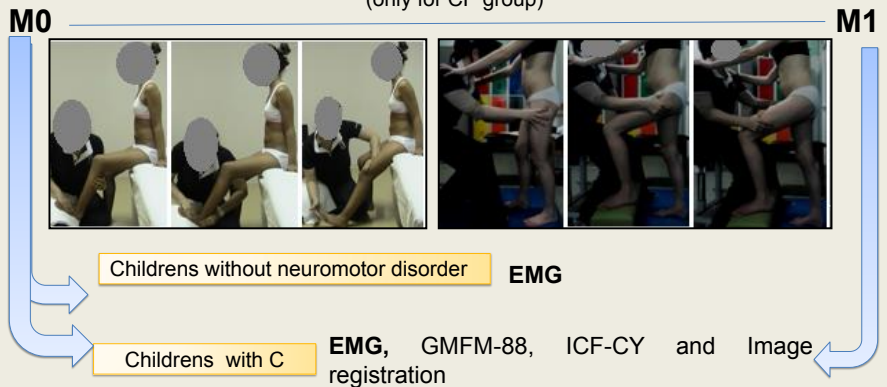
## Methodology

### Participants



### Procedures

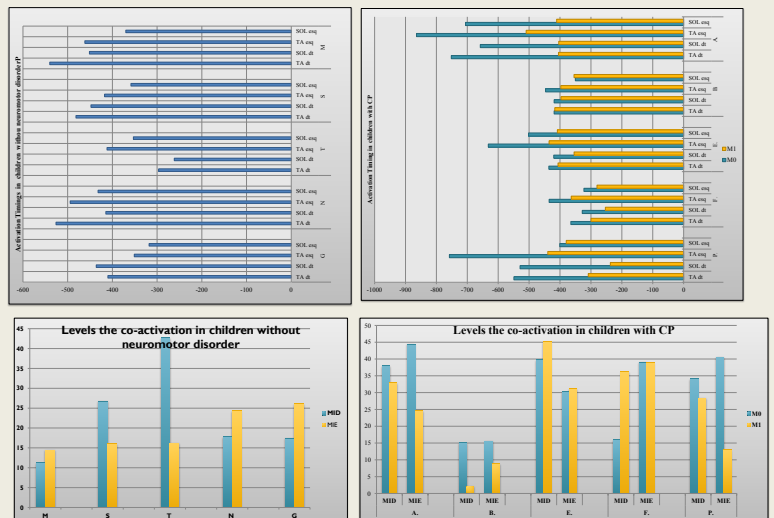
3 months intervention's program based on Bobath Concept – NDT (only for CP group)



Using surface electromyography (EMG) to record muscle parameters such as timings, magnitude and values of co-activation of TA and SOL muscles, during phase 1 and initial phase 2 of the movement sequence of STS.

## Results

Through EMG it was clear that both groups showed activation timings apart from the temporal window considered as anticipatory postural adjustments (APAs) (-200 ms a 50 ms), high levels of co-activation, in some cases reversing the order of muscle recruitment which was possible to change in children with CP after the intervention period, comparatively with typical. It was also verified that the STS sequence was performed with less compensatory movement and better relationship between proximal and distal structures, witch was compatible with the increased score in the GMFM-88 and positive change in activity and participation items in the ICF-CY, after intervention.



## Conclusion

Premature children without and with CP showed changes in the ankle's PC and high levels of muscle co-activation, although more evident in the last. When the activation timings are apart from the temporal window considered as APAs their contribution seems to be less to the quality of PC mechanisms that influence the efficiency of task performance. Intervention strategies and procedures on proximal structures with somatosensory and proprioceptive information against gravity seems to have influence in the global postural control promoting the relationship between proximal and distal structures. After a physiotherapy intervention based on Bobath Concept-NDT children with CP presented positive changes on timing and muscular co-activation with functional impact which are visible on the final score of GMFM-88 and positive changes in the ICF-CY.

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