

Influence of foot alignment in Anticipatory Postural Adjustments in children with cerebral palsy.

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INTRODUCTION

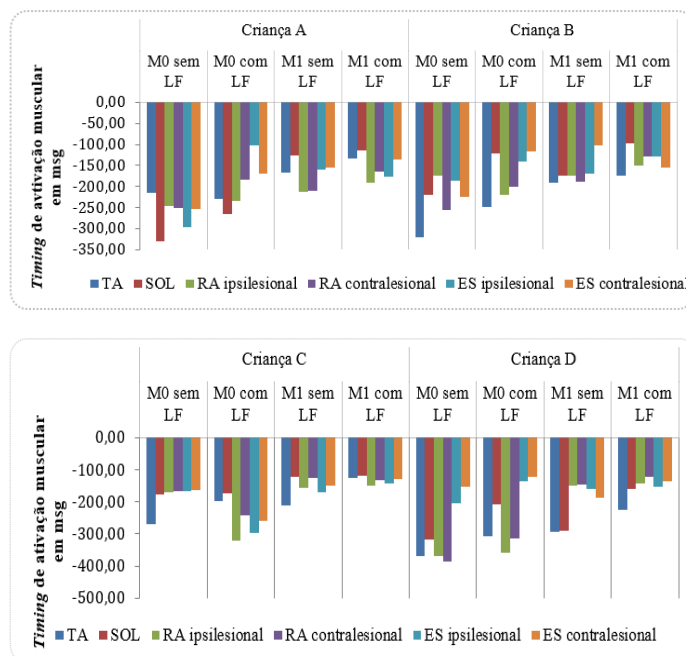
The difficulty in the organization of anticipatory postural adjustments (APAs) is often associated with lack of postural control (PC) in children/young people with motor spastic hemiplegia, resulting from cerebral palsy (CP)¹⁻⁴. Biomechanical changes of the tibiotarsal and foot characteristics are commonly observed in these children/young people and influence the PC as a whole⁵⁻⁸.

METHODS

Four children/youth were assessed in an initial moment (M0) and after 12 weeks of intervention and implementation of an FB (M1). Using surface electromyography, the activation timings of the anterior tibialis, soleus, rectus abdominus and erector spinae (bilaterally) were registered, obtained by electromyography. The beginning of movement was calculated from the change of the signal obtained through the pressure platform. Resorting to the application of TMFM-88 to assess the global motor function and the application of the CIF-CJ the functionality by activities and participation were classified. And proceeding to the registration of the image to facilitate the observation/rating of the components movement of the children/young people in the study.

RESULTS

After the intervention period, there was a modification in the values of the activation timings of the muscles in question, which approached the temporal window defined on APAs as well as the load distribution on the support base, the scores of the TMFM-88, and in the carrying out of the "Activities and Participation". Suggestive of a better organization of PC mechanisms.



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CONCLUSION

Children/young people in the study showed, after a physiotherapy intervention based on Bobath Concept-TND and application of a FB, a favorable evolution of both the PC of the tibiotarsal and foot level, with muscle activation timings temporally more adjusted to the task, and positive repercussions on the activities and participation. A informação aferente proveniente do pé é fundamental para organizar e ajustar os padrões de ativação muscular no início do movimento, assim como para promover uma interação adequada entre os segmentos distais e proximais^{6,9-13}. De facto, a modificação induzida nas crianças/ jovens poderá ter contribuído na organização do tipo de informação ascendente transmitida ao SNC e influenciar as vias descendentes responsáveis pelo controlo postural e por influenciar a musculatura proximal^{14,15}.

1- Carlberg & Hadders-Algra, 2005; 2- Graaf-Peter et al., 2007; 3- Liu, Ziano, & McCoy, 2007; 4- Van der Heide & Hadders-Algra, 2005; 5- Boonyong, 2010; 6- Mouchino et al., 2012; 7- Stebbins, Harrington, Thompson, Zavatsky, & Theologis, 2010; 8- Van der Kregt, Doorenbosch, & Harlaar, 2009; 9- Caderby, You, Peyrot, Begon, & Dalleau, 2014; 10- Gjelsetvik, 2008; 11- Graham et al., 2009; 12- Maki & McIlroy, 1999; 13- Rahe et al., 2009; 14- Haines, 2006; 15- Lundy-Eman, 2008.