

MUSCULAR ACTIVITY OF SPINAL ERECTORS AND RECTUS ABDOMINAL IN PATIENTS WITH ENCEPHALOPATHY DURING THERAPEUTIC RIDING

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INTRODUCTION:

Non Progressive Chronic Encephalopathy (NPCE), a disease from childhood that attacks the Central Nervous System, has a great notability, and for this reason, needs complementary therapeutic modalities that can favor an adequate evolution. This way, therapeutic riding and hippotherapy are some of the alternative ways for the treatment of these patients. With intuit of quantifying the effects of therapeutic riding, the surface electromyography is an option for the muscular analysis.

OBJECTIVE:

Analyze the activation level of rectus abdominal muscle and lumbar erector muscle, throughout surface electromyography, in patients with chronic encephalopathy, comparing adoption of postures in sole, elastic bed and therapeutic riding.

METHOD:

7 subjects with chronic encephalopathy participated of this study, age between 7 and 30 years old, and they were submitted to an assessment of muscular activation, throughout surface electromyography, in different positions over the horse, on an elastic bed and on sole. For data collection, the electrodes were placed according to SENIAM to capture the activation signals during 30 seconds, when each subject should keep

the evaluated posture. The EMG signals were registered with a 4-channel EMG system (Miotoool400 USB, Brazil), with a common mode rejection ratio >110 dB and a sampling rate of 2000 Hz by channel. The filtering of the raw EMG was performed with a filter Butterworth type, with a bandwidth of 25–500 Hz, spacing between electrodes fixed in 30mm. Surface electrodes of Ag/ClAg, round, pre gelded and auto adhesive from MEDITRACE. The results were analyzed considering the media value and the peak value of activation in each task, according to the analysis of Wilcoxon test and Friedman test, with significance level of 0,05 (5%). (Cram Kasman 1998; Basmajian & De Luca 1985).

RESULTS:

It was observed that orthostatism on elastic bed showed activation of 8,9 μ V in rectus abdominal and 26,3 μ V in lumbar erectors; on their knees on elastic bed there was an activation of 9,1 μ V in rectus abdominal and 23,0 μ V for lumbar erectors; on the horse there was a media activation of 13,0 μ V for rectus abdominal and 28,6 μ V for lumbar erectors; static on the horse showed an activation of 9,5 μ V for rectus abdominal and 18,3 μ V for lumbar erectors; on their knees on the horse there was an activation of 14,3 μ V for rectus abdominal and 36,7 μ V for lumbar erectors; gait on sole there was an activation of 18,1 μ V for rectus abdominal and 36,4 μ V for lumbar erectors.

	Lumbar Erectors	Orthostatism	On Knees on Elastic Bed	Seat on Horse Walking	Seat on Horse Static	On Knees on the Horse
Average	On Knees on Elastic Bed	0,594				
	Seat on Horse Walking	0,397	0,433			
	Seat on Horse Static	0,826	0,778	0,149		
	On Knees on the Horse	0,064	0,124	0,109	0,133	
	Gait	0,008	0,001	0,003	0,084	0,730

	Rectus Abdominal	Orthostatism	On Knees on Elastic Bed	Seat on Horse Walking	Seat on Horse Static	On Knees on the Horse
Average	On Knees on Elastic Bed	0,861				
	Seat on Horse Walking	0,233	0,133			
	Seat on Horse Static	0,382	0,638	0,004		
	On Knees on the Horse	0,001	0,009	0,198	0,041	
	Gait	0,001	0,026	0,019	0,001	0,730

DISCUSSION:

When comparing the postures in pairs, the postures performed on the horse required more muscular recruiting than the postures performed on elastic bed, and there was a similar recruiting when compared with gait.

CONCLUSION:

The study suggests that for this studied sample the therapeutic riding could be an alternative that favor the muscular activity and motor development in patients with chronic encephalopathy.

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