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INFLUENCE OF 14 AND 24 HIPPO THERAPY SESSIONS IN POSTURAL BALANCE IN CEREBRAL PALSY – A CASE REPORT

¹Andréa Gomes Moraes, ¹Ana Cristina de David e ¹Guilherme Henrique Ramos Lopes
¹Universidade de Brasília; email: andreafisioucb@yahoo.com.br

SUMMARY

Case report of an adolescent diagnosed with cerebral palsy to evaluate postural balance after 14 and 24 hippotherapy sessions. To make this assessment we used a force platform. Through descriptive analysis of the results we found improvement of postural balance especially after 24 sessions. This result corroborates researches that show improvement in balance after hippotherapy intervention.

INTRODUCTION

Balance and postural control are responsible for the ability to maintain and control de body center of mass within the support base and they are essential for the development of motor skills. It is common for children with Cerebral Palsy (CP) have mutiple impairments during its development, including postural balance deficit wich is an essential requirement for the efficient execution of daily living activities. Many researches show improvement in postural control in these patients after hippotherapy intervention [1,2,3,4,5]. However, there is no consensus in the literature about the number of sessions from which improvements are observed, although changes are reported from 12 sessions. We found no studies comparing the variables of center of pressure (COP) in different numbers of sessions in individuals with CP. Moreover, in hippotherapy are insufficient researches using force plataform. Therefore, the aim of this study was to determine if there was improvement in postural control of an adolescent with CP, after 14 and 24 sessions of hippotherapy.

METHODS

Case report with a male subject, 17 years old, diagnosed with CP classified as Level I in GMFCS and participant in the hippotherapy program of the “Hippotherapy Centre of Military Police of Distrito Federal”.

The intervention was with a trained horse and followed the same protocol atendance at all sessions. 24 sessions were conducted for 30 minutes once a week.

Assessments of balance were performed one week before starting the first session (t0), immediately after 14th session (t14) and again after the 24th session (t24).

To evaluate the displacement of COP was used a force plataform AccuSway AMTI Plus (Advanced Mechanical Technologies, Inc) at a 100Hz frequency and a cut filter of 10Hz. The following variables were analyzed: antero-posterior displacement (COPap) and medial-lateral (COPml), antero-posterior standard deviation (SDap) and medial-lateral (SDml), total length (CompCOP), mean

velocity (VelCOP) and 95% of the area of the ellipse (Area95COP).

The subject was evaluated in bipedal standing posture with arms relaxed beyond body and eyes open. The feet were positioned on the platform according to the most comfortable position for the subject. He was instructed to look at a fixed point located at 1 meter at eye level. 3 trials of 30 seconds were performed with the subject barefoot and 2 minutes were given between attempts.

We performed a descriptive analysis: before and after 14 sessions and after 24 sessions.

RESULTS AND DISCUSSION

Analyzing the absolute values of COP, we perceive an improvement in balance with a decrease of the values of COP especially after 24 sessions. Although this has not been consistent improvement in some parameters in t14 (Area95COP; SDML, COPap, SDAP) after 12 sessions, the same was not observed in the t24, when there was a decrease in all these parameters after 24 sessions (Table 1).

The results of this study corroborate researches [1,2,3,4,5], that showed improvement in balance after intervention with hippotherapy. Silkwood-Sherer et al. [5] found statistically significant improvements in balance deficit of children with mild to moderate balance after 14 sessions of hippotherapy. Similar results were also found by Shurtleff et al. [4] and Bertoti [1].

These improvements may be due to the position that the children takes to be on horseback which inhibits pathological patterns and three-dimensional movement of the horse's gait that generates constant adjustment of balance and posture due to constant acceleration and deceleration and the intense vestibular stimulation, visual and sensorimotor [2,3].

CONCLUSIONS

Although several studies report benefits of practicing hippotherapy for postural balance, there is disagreement about the number of sessions in which the improvements happen. In this study, we found a decrease in the values of all variables of COP, encouraging positive changes in the balance, especially after 24 sessions. The results of this case report are intended to be the starting point for a larger study with more subjects to verify the consistency of this information.

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Table 1: Absolute values of the three trials, mean and standard deviation of the variables of COP

Parameters		t0		t14		t24	
		Mean	±sd	Mean	±sd	Mean	±sd
CompCOP (cm)	Trial 1	30,216		24,080		17,214	
	Trial 2	26,594	27,44	25,935	23,70	22,110	20,63
	Trial 3	25,517	± 2,46	21,078	± 2,45	22,563	± 2,97
Area95COP (cm ²)	Trial 1	2,300		6,329		0,403	
	Trial 2	7,205	4,50	4,895	5,64	1,965	1,18
	Trial 3	4,007	± 2,49	5,694	± 0,72	1,181	± 0,78
VelCOP (cm/s)	Trial 1	1,007		0,803		0,574	
	Trial 2	0,886	0,91	0,864	0,79	0,737	0,69
	Trial 3	0,851	± 0,08	0,703	± 0,08	0,752	± 0,10
COPml (cm)	Trial 1	2,042		2,076		0,517	
	Trial 2	4,188	3,07	2,877	2,85	2,017	1,20
	Trial 3	2,991	± 1,08	3,591	± 0,76	1,057	±0,76
SDml (cm)	Trial 1	0,293		0,507		0,091	
	Trial 2	1,087	0,63	0,586	0,69	0,482	0,27
	Trial 3	0,518	± 0,41	0,990	± 0,26	0,232	± 0,20
COPap (cm)	Trial 1	2,683		2,996		1,044	
	Trial 2	1,797	2,07	1,913	2,17	1,41	1,22
	Trial 3	1,733	± 0,53	1,596	±0,73	1,213	± 0,18
SDap (cm)	Trial 1	0,565		0,761		0,242	
	Trial 2	0,373	0,45	0,452	0,53	0,227	0,25
	Trial 3	0,410	± 0,10	0,370	± 0,21	0,272	± 0,02