Effect of Hippotherapy on Motor Control, Adaptive Behaviors, and Participation in Children with Autism Spectrum Disorder: A Pilot Study.

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Purpose: The specific impact they were looking at was the impact the horse's movement would have on therapy activities focused on posture control and adaptive behaviors and age-appropriate activity engagement as reported by the parent of children with Autism Spectrum Disorder (ASD).

Design/Methods: The study included 7 children diagnosed with ASD. All children received the intervention. None of the participants had previous riding experiences, either recreational or therapeutic, but most had traditional therapy. Since the testing occurred during the school year and most children had school services, they continued these services in addition to the HPOT. Parents provided informed consent and all participants were medically cleared from their doctor before participating. The study design was pre-post design, the parents completed all the measures. The two measures for this study were the Vineland Adaptive Behaviors Scales-II (VABS-II) and the Child Activity Card Sort (CACS). Pre-testing included administering both the VABS-II and the CACS as well as postural assessments using force places and a video motion capture system. After pre-testing, each child participated in one 45 minute HPOT session for a period of 12 weeks. (Note: one child only completed 10 weeks but was still included in results.) A treatment progression for the HPOT session was created prior to intervention and was used throughout the 12 weeks. The activities in the treatment progression moved from basic to advanced activities and were pulled from 5 domains: motor control, functional communication, cognition, social skills, and interactive play. Each treatment session consisted of different mounting positions and position changes, schooling figures completed by the horse such as straight lines, circles, and weaving cones, and different functional skills aimed at stimulating motor planning and sequencing. Examples of the functional skills performed during interventions include following complex directions coupled with position changes, obstacle courses, and tasks and games that required the use of upper extremities. The children also worked on taking turns, and planning and sequencing activities with other children in the arena and/or the therapist. After the 12 weeks were completed, the same methods as discussed in the pre-test were repeated again for post-test measures.

Results: 7 children completed the intervention but one was dropped due to the development of negative behaviors and unwillingness to follow directions. Pre- and post-test HPOT scores were compared and there was a significant improvement noted for postural instability. For the VABS-II there was a significant change from low-functioning to moderately low-functioning in the overall composite score for adaptive behavior post-HPOT. There were no significant differences in the domains or subdomains of daily living and motor skills. The subdomains: expressive and written communication as well as interpersonal skills, play, and leisure did not show any significant changes either. Data from the CACS showed a significant change score post-HPOT for participation in daily activities. The areas of self-care, low-demand leisure, and social interaction all showed moderate-large clinical differences. There were no significant differences noted in the areas of community mobility, high-demand leisure, domestic, and education.

Conclusion: Improvements in receptive communication, coping, and daily participation as well as improved postural stability can be demonstrated after a 12 week HPOT program. Postural mechanisms may have developed automatically as a result of the continual input resulting from the movement of the horse. The improvements in receptive communication, coping, and daily activity participation could also be a direct reflection of the postural improvements. This is because the increased postural stability could provide children with ASD the opportunity to allocate less of their resources towards posture and more resources towards participation and daily activity performance.

Strengths: This study used reliable measures to gather data relative to a child's participations in daily activities and barriers that exist to completing those activities. There were good inclusion and exclusion criteria that allowed for a very specific client population. The development of a treatment progression also ensured that each participant worked on similar skills for each domain. The video-motion capture system provided a concrete, consistent way to measure postural sway and improvements in this measure that could lead to improvements in other areas.

Limitations: The small sample size and ability to generalize to larger populations are the biggest limitation of this study. This study used only parent-report measures, using teacher-report forms would be a better way to gather non-biased data and consistent responses. The consistency of therapists performing the intervention is also a limitation as approaches could have varied from the treatment progression guidelines.

Practical Application:
There are 3 takeaway messages from this study. The first is that HPOT can be a useful treatment tool for addressing postural sway in children with ASD. Next is that with postural control improvements, other improvements in the areas of adaptive behavior and daily activity participation may increase as well. Finally, HPOT appears to effect many different factors which play a role in improving participation and performance for children with ASD.