

ABSTRACT

THE EFFECTS OF THERAPEUTIC TRICYCLE RIDING ON GAIT AND ENDURANCE FOR THREE CHILDREN WITH SPASTIC DIPLEGIC CEREBRAL PALSY

Jenna Lisenby and Angela Spooner

Background and purpose: The purpose of this study was to quantitatively evaluate the effects of the AmTryke® therapeutic tricycle on function, gait parameters, and the physical endurance of three children with spastic diplegia. Children with spastic diplegic cerebral palsy have demonstrated observable and quantifiable endurance and strength deficits in their lower extremities. Due to weakness and spasticity, children commonly walk with a “scissoring” pattern. The goals for most families and physical therapists include strengthening the lower extremities to produce a more typical gait pattern, and prevent future deformity with better alignment during functional activities. Tricycle riding is often designated as therapeutic, and is theoretically a tool to encourage muscle stimulation and strengthening in a typical pattern of co-activation and reciprocal LE function. **Methods:** Three children with a diagnosis spastic diplegia, ages five through nine, were chosen from a sample of convenience. They were evaluated with the GMFM and GAITRite® gait mat over the course of six months, using a single subject ABAB design to determine if any gait changes occurred with therapeutic tricycle riding. Weight, height, leg length, heart rate, and subjective measures were utilized to provide additional information to correlate with any changes observed. **Results:** Subjects one and two increased in gross motor functional measurements over the course of the study, Subject number one received botulinum toxin injections during the second baseline.

Subject number two had observable trends of increased function during therapeutic tricycle riding phases. Subject three gained twelve pounds and declined in function from the onset of the study, both quantitatively and qualitatively. All three children and families subjectively viewed the tricycle riding as socially and physically beneficial.

Discussion and Conclusions: Trends for subjects one and two suggested that the therapeutic tricycle had strengthening effects on gait which allowed for greater velocity, cadence, and increased time in single limb stance. These trends could not be deemed as statistically significant due to large variations in initial baseline gait parameter measurements. For subject three, there did not seem to be any trend to indicate that tricycle riding affected his general decline in function. For all subjects, the therapeutic tricycle was a beneficial tool from a psychosocial perspective. It would be beneficial to replicate the design of this study and further investigate tricycle riding effects on gait and endurance for children with spastic diplegic cerebral palsy. It may also be valuable to study the effects of strengthening with the tricycle in children with spastic diplegia after botox injections.